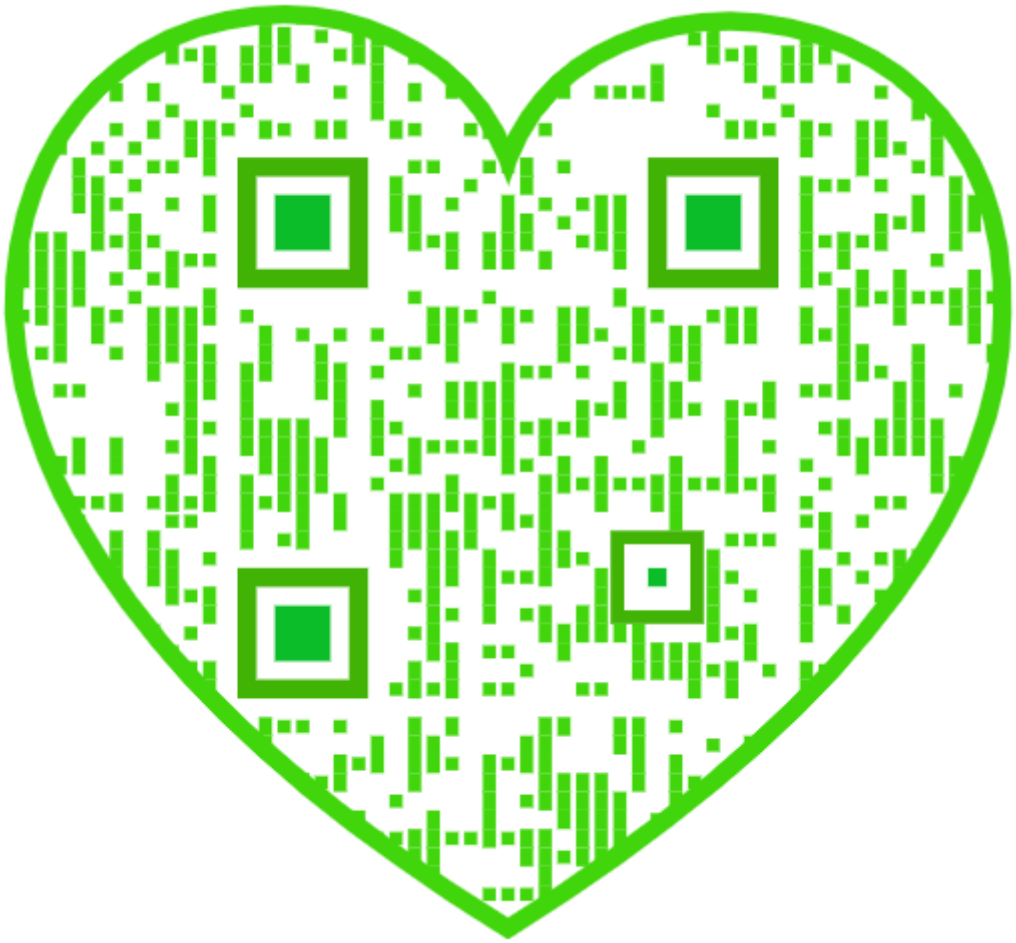
# MINNESOTA MUSHROOMS

CLEMENTS



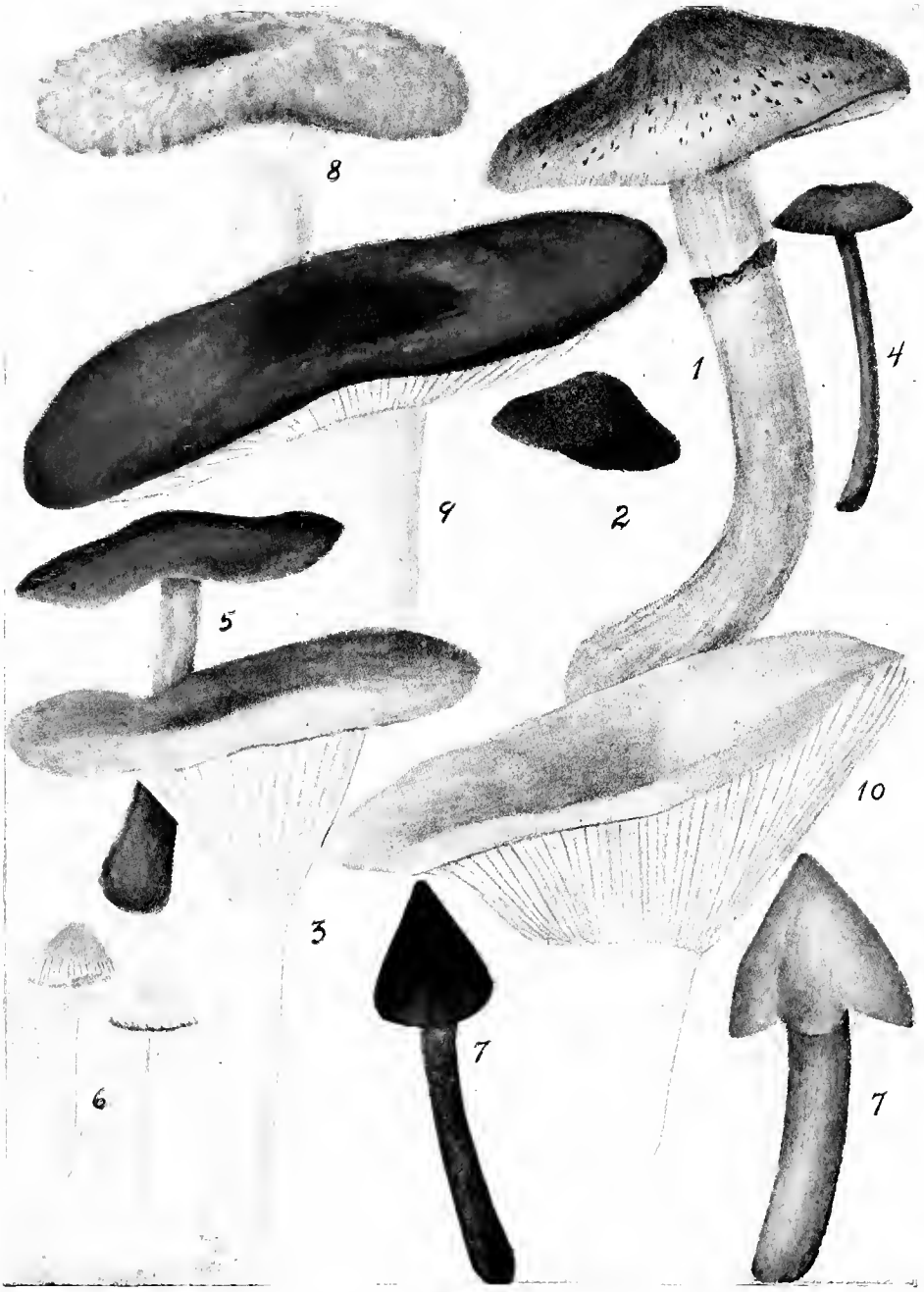



PLATE I.

1. Armillaria mellea 2. Tricholoma terreum 3. Clitocybe infundibuliformis 4. Clitocybe laccata 5. Collybia dryophila 6. Mycena pura 7. Hygrophorus conicus 8. Lactarius torminosus 9. Russula emetica 10. Russula delica

C59

GEOLOGICAL AND NATURAL HISTORY SURVEY OF MINNESOTA
FREDERIC E. CLEMENTS, *State Botanist*

# Minnesota Plant Studies

IV.

## MINNESOTA MUSHROOMS

ILLUSTRATED

FREDERIC E. CLEMENTS

University of Minnesota
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# Preface

The present booklet is the fourth of a series of popular guides to the plants of Minnesota, designed for plant-lovers and for classes in botany in high school and college. An equally important object of the guide to mushrooms is to make available with safety the enormous annual crop of mushrooms, which is now almost entirely wasted through fear or neglect. It is perhaps idle to estimate the size or value of this crop, but if that part which is readily accessible is alone considered, the number of pounds will reach into the hundred thousands. Figured on the market price of the cultivated mushroom, the total value of the mushroom crop of the State can hardly be less than a million dollars. Just what would be the effect of utilizing this food supply is a matter of conjecture, but there can be little doubt that it would prove fortunate from the standpoint of dietetics as well as of economics.

The text has been made as simple and as concise as seems possible without sacrificing clearness. The plant-lover will find as he becomes acquainted with mushrooms in nature that they have many charms, apart from those of the palate, and that the study of appearance, behavior, etc., is as fascinating as with flowering plants. The first requisite however is to be able to strike up such an acquaintanceship, and this, together with the unlocking of a store of delicious food, is the chief object of the text. The student who has the time and interest for more extended work with the mushrooms will naturally refer to the more comprehensive books by Atkinson, McIlvaine, and Hard.

In the preparation of keys and descriptions, Saccardo's "Sylloge Fungorum," Peck's "Reports," and the mushroom books just mentioned have been frequently consulted. While the majority of the illustrations are original, a large number have been taken from the mushroom books by Atkinson, Hard, McIlvaine, Dumee, Michael, White, and from Freeman's "Plant Diseases." Grateful acknowledgment is made to these authors for such use. The writer is indebted to Dr. Edith Clements for the original water color drawings from which the color illustrations have been made, and for the working over of the recipes for cooking mushrooms. He wishes also to acknowledge the aid and interest of the members of the Minnesota Mycological Society, particularly Dr. Mary Whetstone, Miss Daisy Hone, and Mr. L. F. Lambert.

Copies of "Minnesota Plant Studies" are furnished free to citizens of Minnesota, upon request to the undersigned. Ten copies are sent free to each high school, academy or college within the State, and additional copies are furnished at cost, twenty-five cents per copy. It is hoped that collectors will feel free at all times to send specimens to the department of botany to be named. Mushrooms can be sent through the mails readily, if they are wrapped in dry paper, and placed in a strong pasteboard box.

FREDERIC E. CLEMENTS,
*Professor of Botany and State Botanist.*

The University of Minnesota,
July, 1910

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# Kinds of Mushrooms

The word mushroom is used here to include all those flowerless plants which are not leaf-green in color, and are large enough to be seen by the eye. No distinction is made between mushrooms and toadstools, since indeed no distinction exists. A mushroom consists of whitish threads running through the soil or wood on which the plant grows, the spawn or mycelium, and of a spore-bearing body, the fruit-body, which is the part usually seen and known as the mushroom. The kind of fruit-body and the way in which the spores are produced upon it are the chief points by which mushrooms are divided into orders and families. They fall into two great groups, the sack-fungi, where the spores are borne on the inside of cylindric sacks, or asci, and the basidium fungi, where the spores are borne on the tip of tiny clubs, called basidia. The sack-fungi are divided into black fungi, characterized by flask-shaped cavities and usually a coal-like appearance, and cup-fungi, which, as the name indicates, are more or less cup-shaped and usually fleshy. The basidium fungi also fall into two main groups. In the one, the spores are borne on the inside of a ball, which opens at maturity in various ways, as in the puffballs. In the other, the spores are borne on a surface which is exposed from the first or very early, as in the gill-fungi, pore-fungi, etc.

The beginner will find it impossible to discover how a mushroom produces its spores, without the aid of a microscope. Fortunately, the form of the spore-bearing surface and that of the fruit-body or mushroom itself are fairly distinctive. In a few cases, where the same form appears in unrelated families, it may be necessary to determine whether the spores are borne in sacks or on basidia. The following key, it is hoped, will enable the beginner to place a plant in the proper family, without the use of a microscope. This can be done most readily if he will familiarize himself with the forms found in the different families, using the illustrations in the text for this purpose.

In using the key, all that is necessary at each step is to make the proper choice between the divisions bearing the same character. The first choice is made between I and II. If II is taken, the next choice is between 1 and 2, and then under one of these, between a and b, etc.

Individuals which resemble each other closely are said to belong to the same species, as for example, all shaggy manes belong to the species c o m a t u s, meaning shaggy. This species agrees with the species a t r a m e n t a r i u s and the species m i c a c e u s in having black spores and gills that dissolve into an inky liquid. Hence, they are placed in the same genus, C o p r i n u s. The latter is grouped with all the other gilled mushrooms into the family of gill fungi, or A g a r i c a c e a e, a name formed from A g a r i c u s, the genus to which the common cultivated mushroom belongs. In distinguishing a species of mushroom, it is necessary to use both the

name of the genus and of the species, e. g., Coprinus comatus, Lepiota procera, Agaricus campester, etc. A few of the mushrooms have what might be called "common names," and a catch name has been given in the present case for nearly all. So few names are really current, however, that it is very much more satisfactory to use the Latin names without exception.

The pronunciation of the Latin names of families, genera and species is phonetic, in accordance with the following simple rules. The consonants are the same as in English, except that *c* and *g* are always hard, *j* is pronounced like *y*, and *v* like *w*. The vowels are as follows: *a* as ah; *e* as ay; *i* as ee; *o* as oh; *u* as oo; *y* much like ee, or better, like the German *ü* or the French *u*. The diphthongs are as follows: *ae* as aye; *au* as ow; *oe* as oy; *eu* as eoo; *ui* as ooee. The accent has been given for each name.

The measurements are given in metric units, with rare exceptions. These are readily used if it is borne in mind that one inch is approximately 2.5 centimeters, or 25 millimeters. Spores are measured in micromillimeters, or $\mu$: 1000 micromillimeters equal one millimeter.

## Chart-Key Showing the Relationships of the Fleshy Gill Fungi

| Spores: | White | Rose | Ocher | Purple | Black |
|---|---|---|---|---|---|
| I. Stem central | | | | | |
| 1. Cap discrete from stem | | | | | |
| a. Volva and ring present | Amanita | Metraria | | Chitoniella | |
| b. Volva alone present | Amanitopsis | Volvaria | Locellina | Chitonis | |
| c. Ring alone present | Lepiota | Annularia | | Agaricus | Coprinus |
| d. Ring and volva absent | Schulzeria | Pluteus | Pluteolus | Pilosace | Coprinus |
| 2. Cap and stem homogeneous and confluent | | | | | |
| a. Ring present | Armillaria | | Pholiota | Stropharia | Anellaria |
| b. Ring absent | | | | | |
| (1) Curtain present | | | Cortinarius | | Gomphidius |
| (2) Curtain usually absent | | | | | |
| (a) Gills sinuate | Tricholoma | Entoloma | Hebeloma<br>Inocybe | Hypholoma | |
| (b) Gills decurrent | Clitocybe | Clitopilus | Flammula | Deconica | |
| (c) Gills adnate, or free | | | Flammula | Psilocybe<br>Psathyra | Panaeolus<br>Psathyrella |
| 3. Cap and stem heterogeneous but confluent | | | | | |
| a. Gills free | | Leptonia<br>Nolanea | | | |
| b. Gills adnate | | | | | |
| (1) Margin first incurved | Collybia | | Naucoria | | |
| (2) Margin straight | Mycena | | Galera | | |
| c. Gills decurrent | Omphalia | Eccilia | Tubaria | | |
| II. Stem excentric or none | Pleurotus | Claudopus | Crepidotus | | |

Note: The leathery and woody forms, and the fleshy forms without correspondents have been omitted.

## KEY TO THE FAMILIES

I. Plant cap-like to shelf-like, with gills, pores or teeth, usually on the lower surface

1. Cap with gills — Gill fungi 4
2. Cap with pores or tubes — Pore fungi 86
3. Cap with teeth or spines — Tooth fungi 103

II. Plants without gills, pores or teeth; shelf-, coral-, club-, saddle-, cup- or ball-like

1. Plant cup-shaped or saucer-shaped
   a. Cup leathery, with seed-like bodies inside — Bird's nest fungi 133
   b. Cup fleshy, hollow — Cup fungi 144
2. Plant coral-, fan-, club-, saddle-, shelf- or ball-like
   a. Cap without pits or cavities in cross section
      (1) Cap jelly-like or cartilage-like — Jelly fungi 117
      (2) Cap fleshy to leathery, not jelly-like
         (a) Cap coral-, club-, saddle-, shelf- or layer-like, rarely funnel-form
            x. Cap coral-, club-, or saddle-like
               (x) Cap coral-like — Coral fungi 108
               (y) Cap club- or saddle-like
                  m. Cap club-like, not distinct from stem; spores on basidia — Coral fungi 108
                  n. Cap saddle-like or club-like, distinct from stem; spores in sacks — Saddle fungi 135
            y. Cap shelf or layer-like, rarely funnel-form — Leather fungi 113
         (b) Cap ball-like, then broken by the lengthening stem, or cracking to expose the powdery spores
            x. Cap broken by the stem which carries at the tip a more or less sticky, strong-smelling spore mass — Carrion fungi 131
            y. Cap opening by a crack or a mouth to expose the powdery mass of spores — Puffballs 123
   b. Cap with pits or cavities in cross section, usually black and hard, or bright-colored and fleshy when parasitic — Black fungi 150

## GILL FUNGI AGARICACEAE

The fruit-body is generally cap-shaped or umbrella-shaped, with a central stem, though in a few cases the stem is lateral or wanting. The spores are borne on plates or gills which radiate from the stem to the edge of the cap. The gills are on the under side, except when the cap is stemless and inverted. At first, the gills are protected by a membranous or cobwebby veil, which is torn as the cap expands, but often remains as a ring on the stem, or hangs as a fringe from the edge of the

cap. In many cases, this gill veil disappears completely. As the young cap pushes up, it is sometimes covered with a membrane, which is broken by the lengthening stem, and remains at the base of the latter as a cup or volva. The volva may persist, or it may break into scales and finally disappear.

The gill fungi are the only mushrooms certainly known to contain deadly poisons. The fatally poisonous species are confined to the genus A m a n i t a, so that if one learns the distinctive marks of A m a n i t a, he may feel safe from danger. A few species, L e p i o t a m o r g a n i and C l i t o c y b e i l l u d e n s, are violently emetic in their action upon certain people, but are not dangerously poisonous. **The beginner who avoids eating all mushrooms with white gills, a ring around the stem, and a cup or scales at the bulb-like base of the stem will be in no danger of fatal poisoning. Since the volva, especially when scaly, disappears with maturity, and sometimes the ring also, care must be taken to apply this rule to young plants.**

According to the color of the spores, the gill fungi are divided into five groups. The spore color is best determined by means of a spore print, made by cutting off the stem and placing the cap, gills downward, upon a sheet of white paper. As a rule, the spore color may be safely inferred from the color of the gills, or it may be found by means of the microscope, though the latter is more or less misleading, owing to the fact that the spores are seen by transmitted light.

## Key to the Spore Sections


| | | Page |
|---|---|---|
| 1. Spores white, whitish or very dilutely colored | White-spored Fungi | 5 |
| 2. Spores distinctly colored, pinkish, yellow, brown, purple-brown or black | | |
| a. Spores pink or salmon-colored | Rose-spored Fungi | 51 |
| b. Spores yellow to rust-colored | Ocher-spored Fungi | 59 |
| c. Spores purplish or purple-brown | Purple-spored Fungi | 72 |
| d. Spores black-brown to black | Black-spored Fungi | 79 |


## White-spored Gill Fungi Leucosporae

Spores white, whitish, or very dilutely colored yellowish, pinkish or greenish; colorless under the microscope.

### KEY TO THE GENERA


| | | |
|---|---|---|
| 1. Cap fleshy or firm-fleshy, not leathery, corky or woody | | |
| a. Stem central or nearly so | | |
| (1) Gills not vein-like, but thin, plate-like, acute at edge | | |
| (a) Gills fleshy rather than waxy | | |
| x. Stem readily separated from the cap | | |
| (x) Stem with cup or volva at base | | |
| m. Stem with a ring also | Amanita | 6 |
| n. Stem without a ring | Amanitopsis | 11 |

| | | Page |
|---|---|---|
| (y) Stem without a volva at the base; ring present | Lepiota | 12 |
| y. Stem and cap fleshy and continuous, tearing when separated | | |
| (x) Stem with a ring; volva lacking | Armillaria | 17 |
| (y) Stem without ring or volva | | |
| m. Flesh of cap and gills firm, hardly spongy; spores smooth, usually elliptic | | |
| (m) Gills adnate or sinuate | Tricholoma | 17 |
| (n) Gills mostly sloping to the stem, decurrent | Clitocybe | 20 |
| n. Flesh of cap and gills more or less spongy; spores spiny, roundish | | |
| (m) Sap not milky | Russula | 35 |
| (n) Sap milky, white or colored | Lactarius | 38 |
| z. Stem and cap continuous, but stem cartilage-like and distinct from the fleshy cap | | |
| (x) Gills not decurrent | | |
| m. Cap turned in at margin when young | Collybia | 26 |
| n. Cap not turned in at margin when young | Mycena | 28 |
| (y) Gills decurrent | Omphalia | 30 |
| (b) Gills waxy, cap more or less watery | Hygrophorus | 40 |
| (2) Gills vein-like, blunt at edge, decurrent | Cantharellus | 43 |
| b. Stem excentric, lateral or absent | Pleurotus | 31 |
| 2. Cap fleshy-leathery, leathery, corky or woody | | |
| a. Edge of gill not forked | | |
| (1) Cap fleshy-leathery | | |
| (a) Stem separating readily from cap | Marasmius | 44 |
| (b) Stem and cap continuous | | |
| x. Gills toothed at edge | Lentinus | 47 |
| y. Gills entire at edge | Panus | 49 |
| (2) Cap corky or woody, shelf-like | Lenzites | 49 |
| b. Edge of gill forked into recurved halves | Schizophyllum | 51 |

## AMANITA

The cap and stem are readily separated from each other, and the latter bears a ring. At the base of the stem is a cup or volva, which with the ring distinguishes this genus from Lepiota and Amanitopsis; that is Amanita has both ring and volva, Lepiota only the ring and Amanitopsis only the volva. The volva breaks into fragments and disappears in a few species of Amanita, and

only the young plants can then be told with certainty from Lepiota. Amanita contains practically all the deadly poisonous species of the gill fungi. Although several species are edible, in particular, Cæsar's mushroom, the danger of mistaking a poisonous Amanita for an edible one is so great that everyone should take the greatest pains to avoid eating any Amanita whatsoever, and especially mistaking it in the young button stage for a puffball, or in old age for a Lepiota.

The ancient name for some mushroom.

FIGURE 1. AMANITA PHALLOIDES
**Deadly!**

## Key to the Species

1. Cap typically white, rarely yellowish to olive or brownish; volva with more or less of a free border — *A. phalloides*
2. Cap white or buff-brown; volva merely of scales — *A. solitaria*
3. Cap usually bright orange, red or yellow; volva sack-like or merely of scales
   a. Volva large and sack-like, white; all other parts yellow or orange — *A. caesarea*

b. Volva forming rings or scales on a bulb-like base; gills usually white or whitish
   (1) Whole plant dull red; flesh reddening when bruised — *A. rubescens*
   (2) Stem white or yellowish; flesh not reddening
      (a) Cap 3-6 cm. wide; spores globose — *A. frostiana*
      (b) Cap 8-15 cm. wide; spores elliptic — *A. muscaria*

### Amaníta phalloídes Death Cup, Deadly Amanita

Cap 4-10 cm. wide, usually white, more rarely olive, brown or yellow, slimy when moist, smooth or roughened with a few large or many small fragments of the volva; globose, then bell-shaped and finally expanded; stem tall, stout, 7-13 cm. by 10-15 mm., white, rarely dark, usually smooth, bulbous, hollow above, ring superior, large, drooping, white, volva usually large with a free border, but extremely variable; gills white and usually free, rarely slightly touching; spores globoid, 8-10$\mu$.

FIGURE 2. AMANITA VERNA
**Deadly!**

Common in forest and woodland from June to October; the deadliest of all the gill fungi, but easily avoided by the collector if he rejects all mushrooms with both ring and volva. This species causes the majority of the deaths due to eating poisonous forms. Amanita verna is probably only a form of this species: it is equally deadly.

### Amaníta solitária Solitary Amanita

Cap large, 7-15 cm. wide, white or grayish, rarely brownish, the surface often covered with flaky granules or distinct scales which are easily rubbed off, sticking to

the hands, hemispheric to plane; stem tall, 8-20 cm. by 8-12 mm., white, solid, bulbous, with a root-like extension, more or less scaly like the cap, ring torn, more or less appressed, volva scaly, disappearing; gills free or touching, white; spores elliptic, $10 \times 7\mu$. The name refers to its habit of growing solitary, though this is not universal.

Common in woodland and grassland from July to October; said to be edible, but it is dangerous on account of its resemblance to poisonous Amanitas and every one should avoid all risk by leaving it entirely alone.

FIGURE 3. AMANITA SOLITARIA
**Dangerous!**

### Amaníta caesárea Caesar's Mushroom

Cap large, 7-20 cm. wide, reddish, orange or yellow, smooth but beautifully striate toward the margin, ovate to convex or expanded; stem 10-20 cm., tall, yellow or orange, somewhat scaly below the ring, hollow, scarcely enlarged below, ring yellow or orange, large, collar-like, hanging, volva white, large and sack-like; gills free, yellow; spores elliptic, 8-10$\mu$. The name probably refers to the large size and the beauty of this plant.

Rare in open woods; easily mistaken for the deadly fly mushroom and always to be avoided except by the expert.

### Amaníta rubéscens Reddening Amanita

Cap large, 8-12 cm. wide, dull reddish, becoming paler in age, the surface roughened with many cottony grayish scales, ovoid to convex, then expanded; stem stout, 10-15 cm. tall, 20-25 mm. thick, dull reddish, reddening when touched or bruised, ring large, superior, white, volva showing only as a few fragments, readily disappearing from the upper part of the bulbous base of the stem; gills shining white, touching the stem with lines running down it; spores ellipsoid, 7-9$\mu$. The name refers to the characteristic reddening of the flesh.

Infrequent in forest and woodland from June to October; edible but always to be avoided except by the expert who knows the many variations of our species of Amanita.

### Amaníta frostiána Frost's Amanita

C a p small, 3-6 cm. wide, bright yellow or orange, with wart-like scales or occasionally nearly smooth, margin striate, convex to plane; s t e m 5-8 cm. tall,

FIGURE 4. AMANITA MUSCARIA
**Deadly!**

white or yellow, bulbous, stuffed, r i n g delicate, often disappearing, v o l v a a delicate margin on the bulbous base, or consisting of a few yellowish scales; g i l l s white or yellowish; s p o r e s globose, 8-10*u*. Infrequent; poisonous.

### Amaníta muscária Fly Cap

Cap large, 10-15 cm. wide, bright red or orange, becoming yellow or even whitish in age, roughened with many thick white angular fragments of the volva, which often disappear in age, margin striate, globose to convex, more rarely expanded; stem stout, 8-15 cm. by 2-4 cm., white, scaly, bulbous, hollow, ring large, apical, torn, volva forming several concentric scaly rings on the bulb; gills free or touching, white or yellowish; spores elliptic, 8-10 × 6-8$\mu$. The name refers to the use of this fungus to kill flies.

Frequent in woodland, forest or clearing from June to frost; deadly poisonous.

FIGURE 5. AMANITOPSIS VAGINATA

AMANITOPSIS

The cap and stem are readily separable as in Amanita and Lepiota, but the entire absence of a ring at all stages distinguishes this genus from its relatives. In our one species the volva is large and sheathing. The generic name indicates the relationship with Amanita.

### Amanitópsis vaginàta
### Sheath Stem

Cap medium or large, 4-10 cm. wide, gray, yellowish, mouse-colored or brownish, thin, smooth, ovoid or bell-shaped to convex or expanded, beautifully striate-ridged from the margin toward the disk; stem tall, 8-20 cm. by 6-9 mm., white, mealy or smooth, stuffed or hollow, volva a soft close sheath which collapses readily; gills free, white; spores globoid, 8-10$\mu$. The name refers to the sheathing volva.

Frequent in grassland and woodland, from June to October; edible, but not readily distinguished by the beginner from certain poisonous species of Amanita.

## LEPIOTA

The cap separates readily from the stem at the point of attachment, and is more or less scaly. The stem bears a ring which is either fixed or movable, and in the smaller forms often disappears after the cap expands. The gills are free from the stem, rarely touching, and are typically white, though greenish in one species.

FIGURE 6. LEPIOTA PROCERA

Lepiota differs from Amanita and Amanitopsis in the absence of the volva, and from Amanitopsis also in the presence of a ring. All our species of Lepiota grow on the ground, and are edible, though one or two are known to be somewhat poisonous to certain people. Great care must be taken not to confuse with Lepiota those species of Amanita in which the volva is fragmentary or disappears early. The name refers to the scaly cap.

## Key to the Species

1. Ring movable, large; caps large, usually more than 10 cm.
   a. Gills white or whitish; flesh white — *L. procera*
   b. Gills greenish; flesh becoming reddish when cut — *L. morgani*
2. Ring usually fixed, often disappearing when old; caps medium to small
   a. Cap white to yellow, without conspicuous scales
      (1) Cap white to buff, smooth — *L. naucina*
      (2) Cap white to yellow, mealy with tiny brown scales; margin folded — *L. cepaestipes*
      (3) Cap white, with a dense mealy down; margin not folded — *L. farinosa*
   b. Cap tawny to reddish brown, with marked reddish or brownish scales
      (1) Flesh becoming reddish when cut or dried — *L. americana*
      (2) Flesh persistently white or whitish
         (a) Ring large; cap woolly, rough with erect acute scales — *L. acutesquamosa*
         (b) Ring small, line-like or disappearing
            x. Ring small, disappearing; cap with reddish-brown flat scales; gills free — *L. cristata*
            y. Ring line-like, cap reddish-yellow, scales grain-like; gills touching — *L. granulosa*

### Lepióta procéra Parasol Mushroom

Cap large, 6-15 cm. wide, grayish-brown to brown at the center or umbo, the surface breaking into large brownish scales except at the center, bell-shaped or convex to plane; stem tall, slender, 12-25 cm. by 4-8 mm., paler than the cap, enlarged at the base, cracked or scaly, hollow or stuffed, ring large, movable, whitish brown; gills free, whitish, broad, crowded; spores white, elliptic, 12-18 × 8-10$\mu$. The name refers to the tall stem.

Common in late summer and autumn, in grasslands, pastures, lawns, roadsides, etc., or in open woodlands. Odor pleasant; flavor delicious; especially adapted to drying for winter use.

### Lepióta mórgani Green Gill

Cap very large, 15-30 cm. wide, white or whitish with many brownish or yellowish scales, especially toward the disk, convex to expanded or upturned; stem tall, stout, 15-35 cm. by 2-3 cm., whitish, somewhat bulbous at base, smooth, stuffed; flesh white becoming reddish or yellowish when wounded; gills free, white, then turning green, crowded; spores ovate or ellipsoid, greenish, 10-12 × 7-8$\mu$. The name refers to the discoverer, Professor Morgan.

Not uncommon in meadows and pastures, but rare in the woods; often forming large fairy rings. Some collectors find this species delicious, but since it is known to poison some people seriously, it should be eaten by no one until he has tried the effect of a small piece upon himself.

### Lepióta naucína Smooth Lepiota

Cap medium, 5-10 cm. wide, wholly white or somewhat buff, smooth or rarely with tiny scales, spherical to bell-shaped, then convex or expanded; stem rather stout, 5-12 cm. by 7-15 mm., white, more or less covered with fibers, enlarged below, stuffed, then somewhat hollow; gills free, white, then pink when old, crowded; spores oval, 8-10 × 5-8$\mu$. The name refers to the shape of the cap.

Common in meadows, lawns and along grassy roadsides during September and October. This is among the best of the edible mushrooms; it resembles the common mushroom, Agaricus campester, but is readily distinguished by the fact that the white gills become pink only when the plant is mature or old.

FIGURE 7. LEPIOTA NAUCINA

### Lepióta cepaestípes Onion Stem

Cap small, 2-5 cm. wide, white to yellow, the disk becoming darker, the surface roughened with many tiny brownish scales, ovate or bell-shaped, then expanded, margin striate or folded; stem 5-10 cm. tall, white with little fibers, tapering upward, swollen toward the base, hollow, ring thin, sometimes falling away; gills free, white, crowded; spores elliptic, 8-10 × 5-8$\mu$. The name refers to the swollen tapering stem.

Occasional in rich open ground, densely clustered; reputed to be delicious when cooked in any way.

### Lepióta farinósa Mealy Lepiota

Cap medium, 4-7 cm. wide, white or whitish, becoming brownish on the disk, the surface covered with a dense white meal, which cracks forming irregular loose scales, ovate or bell-shaped, becoming convex or expanded in age; stem 5-8 cm. by 4-8 mm., white to yellowish, mealy or smooth, equal or somewhat broader below,

hollow or stuffed above, solid below, ring torn, often disappearing; gills free, white, crowded; spores ovoid, 10-12 × 5-8μ. The name refers to the mealy cap.

Uncommon, edible; closely resembling L. cepaestipes, but the cap more mealy and not striated or folded on the margin.

### Lepióta americána Red Flesh

Cap small to medium, 3-10 cm. wide, white, but with many reddish or reddish brown scales and uniformly reddish on the disk, ovate to expanded or even upturned;

FIGURE 8. LEPIOTA AMERICANA

stem rather stout, 6-10 cm. by 4-10 mm., white, smooth, thicker below, hollow, ring usually well-developed; gills free, white, crowded; spores elliptic, 1-guttate, 8-10 × 6-8μ. Name geographical.

Common singly or in clusters on the ground, especially in grassland, from June to October; readily recognized by its habit of turning red or reddish when bruised or cut, or in age. One of the best of the edible species; it turns milk reddish when cooked in it, but this does not affect its flavor.

### Lepióta acutesquamósa Scaly Cap

Cap small to medium, 5-8 cm. wide, tawny to brownish, roughened with small erect acute scales, often spine-like or curved, which are usually larger and closer on

the disk, convex or plane; stem stout, or slender, 5-8 cm. tall, white to brownish, silky below the ring, mealy above, stuffed or hollow, ring thin, persistent; gills free, white or whitish, crowded; spores elliptic, $7 \times 4\mu$. The name refers to the sharp-pointed scales.

Not uncommon in woodland and gardens; excellent.

### Lepióta cristáta Crested Lepiota

Cap small, 1-4 cm. wide, reddish or reddish brown, the surface cracking into reddish, more or less concentric scales and exposing the white below, the disk more or less constantly reddish, but occasional plants nearly white, hemispheric to convex or nearly plane; stem slender, 2-5 cm. by 2-4 mm., white, smooth or fibrous, hollow, ring small, often disappearing completely; gills free, white, crowded; spores oblong or elliptic, $5\text{-}7 \times 3\text{-}4\mu$. The name refers to the crested appearance of the cap.

Common in woodland, rarely in grassland, especially in autumn; edible.

FIGURE 9. ARMILLARIA MELLEA

### Lepióta granulósa Grainy Lepiota

Cap small, 2-6 cm. wide, yellowish, rusty or yellowish red, roughened with many tiny grain-like or bran-like scales, convex to plane; stem 2-5 cm. tall, white above the ring, colored like the cap below it, nearly equal, stuffed or hollow, ring delicate, soon disappearing; gills touching the stem or slightly attached to it, white, crowded; spores elliptic, $4\text{-}5 \times 3\mu$. The name refers to the granular cap.

Infrequent in open woods; edible.

### ARMILLARIA

The flesh of the cap and stem is uniform and continuous. The stem has a fixed ring, which is now and then inconspicuous, especially in age. The gills are usually attached and white or whitish. Armillaria differs from Lepiota and Amanita in the continuity of stem and cap, and from Amanita in the absence of the volva. All the species are edible. The name refers to the bracelet-like ring.

## Armillária méllea Honey Cap

PLATE I: 1

Cap large, 3-15 cm. wide, usually honey-colored, but varying through all shades of yellow to brown, typically marked with small tufts of brownish or blackish hairs, especially toward the center, though sometimes woolly or entirely smooth, margin often striate, convex to expanded; stem tall, stout, 3-15 cm. by 6-20 mm., whitish, yellowish, or brownish, especially below the ring, smooth or scaly, hollow or stuffed, ring usually thickish and conspicuous, but sometimes thin or even lacking; gills touching broadly or running down the stem, whitish or yellowish; spores elliptic or rounded, 7-10$\mu$. The name refers to the honey-like color.

One of the commonest and most variable of the mushrooms; it occurs most frequently at the base of stumps, but grows also on the ground and on decaying stumps and logs. It is edible, but the flavor and texture are only fair. This species is often parasitic on the roots of trees, especially spruces, pines, etc., breaking down the roots and sometimes resulting in the death of the tree.

### TRICHOLOMA

This genus is distinguished from Armillaria by the absence of a ring, and from Clitocybe by sinuate or adnate gills instead of decurrent ones. It is most easily confused with Collybia, from which it differs in the usually more or less stout fleshy stem, of the same substance as the cap. The species of this genus are edible with a few exceptions, notably those with unpleasant smell. The name means "hair-fringe," but has slight application.

## Key to the Species

1. Odor strong and unpleasant
   - a. Cap brownish; flesh reddish when bruised — *T. saponaceum*
   - b. Cap sulphur-yellow; flesh yellowish, unchanging — *T. sulphureum*
2. Odor more or less pleasant
   - a. Cap sticky when moist; light yellow, with dark threads — *T. scjunctum*
   - b. Cap not sticky, scaly or smooth
     - (1) Cap scaly or silky-hairy
       - (a) Cap white, 10-14 cm. wide — *T. grande*
       - (b) Cap brown to mouse-colored, 2-8 cm. wide — *T. terreum*

(2) Cap smooth
  (a) Gills violet or lilac, brownish in age — *T. personatum*
  (b) Gills white
    x. Cap white
      (x) Margin even; taste sharp or bitter — *T. album*
      (y) Margin scalloped; taste mild — *T. patulum*
    y. Cap dark; taste mild — *T. melaleucum*

### Tricholóma saponáceum Soap Cap

Cap large, 5-10 cm. wide, grayish to brown, the surface dotted or more or less cracked into scales or fibrils, moist but not sticky when wet, edge turned in at first, then convex and expanded, the flesh reddening when wounded; stem stout, 4-10 cm. by 1 cm., sometimes rooting at base, whitish or grayish, often with black hairs, solid; gills sinuate, whitish, narrow, distant; spores subglobose, 4-5$\mu$. The name refers to the soapy smell.

On ground in woodland; not poisonous but extremely distasteful.

### Tricholóma sulphúreum Sulphur Cap

Cap medium, 2-8 cm. wide, sulphur-yellow when young, becoming dingy or reddish, finely hairy or silky at first, then smooth, convex to expanded, flesh yellow, unchanging; stem 5-10 cm. by ½-1 cm., sulphur-yellow, smooth, stuffed or hollow; gills sinuate, sulphur-yellow; spores oblong-elliptic, 10 × 5$\mu$. The name refers to the color of the whole plant.

On ground in woods; smell and taste very forbidding, though the plant is not certainly known to be poisonous.

### Tricholóma sejúnctum Sticky Tricholoma

Cap medium, 4-8 cm. wide, whitish to light yellow, the surface sticky when moist and with dark threads, convex to expanded, umbonate; stem stout, 4-10 cm. by 1 cm., shining white, smooth, solid; gills sinuate, white, broad, readily separating from the stem; spores subglobose, 6-7$\mu$. The name refers to the readiness with which the gills separate from the stem.

On ground in woods; edible, tender and well-flavored.

### Tricholóma gránde Large Tricholoma

Cap large, 10-14 cm. wide, white or whitish, often darker toward the disk, roughened with brownish scales, more or less silky toward the margin, hemispheric to convex and finally irregular; stem stout, 5-10 cm. by 2-4 cm., pure white, somewhat fibrillose, solid; gills sinuate, white, close; spores elliptic, 9-10 × 6$\mu$. The name refers to the large size.

On ground among fallen leaves; edible, but scarcely desirable.

### Tricholóma térreum Earth Cap

PLATE I: 2

Cap small, 2-8 cm. wide, gray-brown to mouse-colored, covered with close scales or fibers, often closer and concentric toward the disk, bell-shaped or convex, rarely plane; stem short, 2-5 cm., paler than the cap, with fibers, solid to hollow; gills adnexed, whitish or gray, the edge more or less toothed; spores globose to elliptic, 5-7 × 4-6$\mu$. The name refers to the earthy color and appearance of the cap.

On the ground in woods, especially in the needle mold at the base of spruces and firs; edible, but the quality only fair.

FIGURE 10. TRICHOLOMA PERSONATUM

### Tricholóma personátum Bluehat

Cap medium to large, 5-15 cm. wide, pale, grayish or brownish, usually with a characteristic tinge of lilac or violet, smooth, but the incurved margin often with fine threads at first, convex, more rarely plane and irregular; stem short and thick, 3-7 cm. by 1-2 cm., more deeply lilac or violet than the cap, but growing paler in age, with fine threads, solid or spongy; gills adnexed or sinuate, lilac or violet, becoming brownish in age; spores elliptic, 8 × 5$\mu$, dull pink or brownish in mass. The name has no obvious application.

On the ground, in woods, especially in leaf-mold, appearing in late summer or autumn; one of the most delicious of all mushrooms. Probably an Entoloma, as indicated by the pinkish spores.

### Tricholóma álbum White Tricholoma

Cap medium to large, 5-12 cm. wide, white, the disk sometimes yellowish, smooth, dry, convex to plane and irregular, the margin turned in at first; stem 5-10 cm. by 1 cm., white, with a few threads, solid, elastic; gills sinuate, white, crowded; spores ellipsoid, 5-6$\mu$. The name refers to the color of the whole plant.

Common in woods from August to frost; edible and fairly attractive.

### Tricholóma melaleúcum Dark Tricholoma

Cap rather small, 2-7 cm., dark gray or smoke-colored, smooth, umbonate, bell-shaped to convex; stem rather slender, 5-12 cm. by 1 cm., whitish, with a few threads, stuffed or hollow, elastic; gills sinuate, white, broad, crowded; spores ellipsoid, 9-10 × 5-6$\mu$. The name refers to the contrast between the dark cap and white gills.

On the ground in woods, in autumn; probably edible, though not tested by the writer.

### Tricholóma patúlum Scallop Top

Cap medium to large, 5-15 cm. wide, white to grayish, rarely with a tinge of yellow, smooth, convex, then plane and upturned, the margin folded and scal-

FIGURE 11. TRICHOLOMA PATULUM

loped; stem short and thick, 2-6 cm. by 1-2 cm., white to grayish, smooth but powdered at the top, solid; gills sinuate, white, or whitish, crowded, often connected by veins; spores ellipsoid, 7-8 × 4-5$\mu$. The name refers to the spreading cap.

On the ground in woods, late summer and autumn; probably edible but not tested by the writer.

## CLITOCYBE

This genus is distinguished by the sloping or decurrent attachment of the gills and the fleshy stem. It lacks both ring and volva, as does Tricholoma,

from which it differs solely in the way the gills run down the stem. Some species can be placed as readily in one genus as the other, and one, C l i t o c y b e l a c c a t a, does not belong properly in this genus at all. C l i t o c y b e consists almost wholly of edible species, though one or two are injurious to certain people. The name refers to the decurrent gills.

## Key to the Species

1. Cap gigantic, often 2-3 dm. (8-12 inches)
   a. Gills slightly decurrent, branched and connected by veins, yellowish or reddish — *C. gigantea*
   b. Gills long-decurrent, separate, whitish — *C. maxima*
2. Cap small or medium to large, rarely more than 12 cm. (5 inches)
   a. Gills decurrent
      (1) Cap bright yellow, orange or green
         (a) Cap bright yellow or orange — *C. illudens*
         (b) Cap green or olive; odor of anise — *C. odora*
      (2) Cap white to tan or brown
         (a) Cap typically white or whitish, not gray, tan or brown
            x. Small, 2-3 cm. wide
               (x) Fragrant, smelling like anise — *C. fragrans*
               (y) Fragrance slight or none
                  m. Stem cartilage-like, hollow, rooting at base — *C. candicans*
                  n. Stem fibrous, stuffed — *C. dealbata*
            y. Medium to large — *C. robusta*
         (b) Cap gray, tan or brown, rarely reddish
            x. Gills purple or purplish; cap pale yellow — *C. ochropurpurea*
            y. Gills not purple
               (x) Cap usually funnel-form
                  m. Cap dark brown or smoky — *C. cyathiformis*
                  n. Cap tan or reddish — *C. infundibuliformis*
               (y) Cap convex or plane, or slightly depressed
                  m. Plants densely crowded
                     (m) Cap convex, grayish or pale tan — *C. multiceps*
                     (n) Cap flat or depressed, honey-colored to brownish — *C. monadelpha*
                  n. Plants rarely densely crowded
                     (m) Cap gray; gills narrow, crowded — *C. nebularis*
                     (n) Cap brownish; gills broad, not crowded — *C. media*
   b. Gills adnate
      (1) Cap watery, rose, reddish or bluish — *C. laccata*
      (2) Cap green or olive — *C. odora*

### Clitócybe gigantéa Giant Clitocybe

C a p usually very large, 1-3 dm. wide, whitish or tan-colored, smooth, sometimes cracking into scales when dry, plane, then depressed or concave, margin turned in at first, more or less irregular and lobed; s t e m short and stout, 4-5 cm. by 1-2 cm., whitish or tan, smooth, solid; g i l l s short decurrent, whitish or tan, finally tinged with yellow or reddish, branched or connected by veins, broad and crowded; s p o r e s elliptic, 5 × 3$\mu$. The name refers to the size of the plant.

On the ground in woods, from August to frost; edible.

### Clitócybe máxima Great Clitocybe

C a p usually very large, 1-3 dm. wide, whitish or tan, smooth or slightly silky or scaly in age, concave, the margin turned in and somewhat lobed; s t e m stout, 8-10 cm. by 2-3 cm., whitish, somewhat fibrous, solid; g i l l s long decurrent,

FIGURE 12. CLITOCYBE MAXIMA

whitish, not branched or connected by veins; s p o r e s elliptic, 5-6 × 3-4$\mu$. The name refers to the size.

On the ground in woods, throughout summer and autumn; distinguished from the preceding by the more funnel-shaped cap, and the whitish, long decurrent gills. Coarse, but well-flavored and edible.

### Clitócybe illúdens Orange Cone Saffron Top

C a p large, 7-15 cm. wide, dark yellow or orange-brown, smooth, convex or flat at first, then depressed or deeply concave, often irregular from mutual pressure; s t e m tall, 10-20 cm. by 1-1½ cm., deep yellow or orange, smooth, solid; g i l l s running far down the stem, yellow to orange, distant; s p o r e s rounded, 4-5$\mu$. The name refers to the deceptively attractive appearance.

Growing in large clusters about old stumps or dead trees from August to frost. Though not deadly, this plant is poisonous to nearly every one, and should

not be eaten. It possesses the power of phosphorescence, and hence is always of interest.

### Clitócybe odóra Green Clitocybe

Cap small, 4-5 cm. wide, pale green to dark green or olive, smooth or somewhat silky when dry, convex, then plane or depressed; stem slender, 2-4 cm. by 4-5 mm., whitish or grayish, smooth, elastic, stuffed; gills adnate or decurrent, greenish to whitish, broad; spores elliptic, 6-8 × 4-5$\mu$. The name refers to the pleasant spicy smell.

In leafy woods, from August to October; edible, but perhaps best used as a flavor for other kinds of mushrooms.

### Clitócybe frágrans Fragrant Clitocybe

Cap small, 2-3 cm. wide, whitish, smooth, watery, plane, then depressed or somewhat funnel-like; stem slender, 4-5 cm. by 4-5 mm., smooth, whitish, elastic, stuffed or hollow; gills short decurrent, whitish; spores ellipsoid, 6-7 × 4$\mu$. The name refers to the anise-like odor.

On the ground in mossy woods, July to November; edible.

### Clitócybe cándicans White Clitocybe

Cap small, 2-3 cm. wide, white and shining, smooth or finely silky, convex, then plane or concave; stem slender, 2-5 cm. by 3-5 mm., white, shining, smooth, cartilage-like, hollow, rooting at base; gills short decurrent or almost adnate, white, narrow and crowded; spores subglobose, 5-6 × 4-5$\mu$. The name refers to the shining whiteness of the plant.

In leaf mold in woods; said to be tough, but excellent when well-cooked.

### Clitócybe dealbáta Ivory Top

Cap small, 2-4 cm. wide, white and shining, smooth, plane, finally upturned and the margin wavy; stem slender, 2-3 cm. by 3-4 mm., whitish, fibrous, stuffed; gills slightly decurrent, white, crowded; spores ellipsoid, 4-5 × 2-3$\mu$. The name refers to the white color.

In grassland and woodland, in autumn; said to be delicious.

### Clitócybe robústa Stout Clitocybe

Cap medium, 7-10 cm. wide, white, smooth, convex, then flat or slightly concave, the margin at first turned in; stem stout, 3-5 cm. by 1-2 cm., white, smooth, solid; gills decurrent, white, crowded; spores elliptic, 8 × 5$\mu$. The name refers to the stout form.

On the ground in woods, in autumn; edible.

### Clitócybe ochropurpúrea Purple Top

C a p small, 4-5 cm. wide, pale yellow or ocher-yellow, sometimes tinged with purple, smooth or very slightly hairy, convex to flat, then upturned and irregular; s t e m tall, 5-8 cm. by 1-2 cm., thicker near the middle, pale yellowish, purplish in spots, often rough with fibers, solid; g i l l s decurrent, purple, in age whitened by the spores.

On ground in woods, during summer and autumn; excellent when well-cooked.

### Clitócybe cyathifórmis Cup Top

C a p small, 3-7 cm. wide, dark brown or smoky, smooth, sometimes slimy when moist, flat or depressed, finally funnel-form and irregular; s t e m slender, 5-10 cm. by 5-8 mm., brownish or smoky, covered with threads, woolly at base, stuffed or hollow; g i l l s decurrent, more or less brownish, distant, often joined near the stem; s p o r e s elliptic, 8-10 × 5-6$\mu$. The name refers to the cup-like cap.

In woodland and grassland, rarely growing on decaying wood, in autumn; edible.

### Clitócybe infundibulifórmis Funnel Top

Plate I: 3

C a p small to medium, 5-10 cm. wide, tan or buff, tinged with reddish, smooth, flat, then depressed and funnel-form, often irregular from mutual pressure in clusters; s t e m somewhat stout, 3-8 cm. by 6-12 mm., pinkish tan or buff, smooth, tapering upward, stuffed or hollow, with a mass of white hairs at the base among the leaves; g i l l s decurrent, whitish; s p o r e s ellipsoid, 5-6 × 3-4$\mu$. The name refers to the funnel-like cap.

Among leaves in woods, during summer and autumn; edible and of good quality.

### Clitócybe múlticeps Tufted Top

C a p small, 3-7 cm., grayish-tan or whitish, smooth, hemispheric to convex and irregular from pressure; s t e m short, or lengthened in age, 3-8 cm. by 6-10 mm., whitish or grayish, smooth, elastic, stuffed or solid; g i l l s adnate or decurrent, whitish, crowded; s p o r e s rounded, 5-7$\mu$. The name refers to the habit of growing in dense clusters.

Growing in dense masses in meadows and lawns, from spring to freezing weather, often into December; one of the best of edible species.

### Clitócybe monadélpha Honey Top

C a p small, 3-8 cm. wide, honey-colored to brownish, at first smooth, then more or less cracked or scaly, convex, then flat or depressed; s t e m tall, slender,

often curved, 8-15 cm. by 6-10 mm., pale brownish or reddish, fibrous, tapering downward, solid; gills decurrent, pale reddish-brown; spores ellipsoid, 8 × 6μ. The name refers to the dense clusters.

In dense clumps in grass or about stumps, from spring to severe frost; edible.

## Clitócybe nebuláris Gray Clitocybe

Cap medium, 5-10 cm. wide, gray or pale smoke-colored, smooth, convex to flat or slightly depressed; stem 3-6 cm. by 8-10 mm., whitish, tapering upward as

FIGURE 13. CLITOCYBE MONADELPHA

a rule, smooth, solid; gills decurrent, whitish, crowded; spores ellipsoid, 4-5 × 2-3μ. The name refers to the gray cap.

On the ground in woods, autumn or late summer; rare but delicious.

## Clitócybe média Brown Clitocybe

Cap medium, 5-10 cm. wide, dark, grayish brown or blackish, smooth, convex, then plane or slightly concave; stem 3-6 cm. by 8-10 mm., brownish, smooth, elastic, solid; gills more or less decurrent, whitish, often connected by veins; spores elliptic, 8 × 5μ. The name refers to its relationship to the preceding species.

On the ground in shady woods, autumn; excellent.

### Clitócybe laccáta Rose Cap

PLATE I : 4

Cap small, 1-5 cm. wide, flesh-colored, pink, reddish, or even bluish, watery, and translucent, smooth or very finely hairy, often striate or scalloped at the margin, convex, more rarely expanded or depressed, but usually sunken in the middle; stem slender, 2-8 cm. by 4-6 mm., colored like the cap, smooth, waxy, elastic, stuffed or hollow; gills sinuate or with a small decurrent tooth, pinkish or reddish, broad, distant; spores subglobose, 8-10$\mu$. The name refers to the waxy texture.

Common in wet places, meadows, also swamps and thickets, throughout summer and autumn; edible.

FIGURE 14. CLITOCYBE LACCATA

### COLLYBIA

This genus is distinguished from Tricholoma and Clitocybe by the horny or cartilaginous nature of its stem, which is thus more or less distinct from the fleshy cap. The stem is consequently more slender and graceful. From Mycena, Collybia is distinguished by the inturned margin of the cap, a feature often to be recognized only in the young plants. It differs from Marasmius only in being more fleshy, and there are certain species which may be placed with equal warrant in either genus. All of our species are edible. The name refers to the form of the cap.

#### Key to the Species

1. Stem tall, with a long root; gills broad and distant
   a. Cap and stem velvety — *C. longipes*
   b. Cap and stem not velvety
      (1) Cap sticky when moist — *C. radicata*
      (2) Cap not sticky when moist; gills very broad — *C. platyphylla*
2. Stem shorter, rarely rooting; gills usually narrower and closer; mostly in dense clusters
   a. Cap very sticky when moist; stem velvety — *C. velutipes*

b. Cap not sticky when moist; stem smooth or velvety
(1) Stem smooth — *C. dryophila*
(2) Stem with a white velvet or down — *C. confluens*

### Collýbia lóngipes Long Stem

Cap small, 2-5 cm. wide, brownish to red-brown, densely and finely velvety, very sticky, convex to flat, more or less raised in the center; stem tall, 10-16 cm. by 4-8 mm., brownish and velvety like the cap, stuffed, tapering upward and with a long tapering root at the base; gills sinuate or adnexed, white, broad and distant; spores globose, 8-12$\mu$. The name refers to the long stem.

Solitary on the ground or long-decayed logs, during summer and autumn; excellent.

### Collýbia radicáta Root Stem

Cap medium, 4-10 cm. wide, whitish, gray, brown or blackish, smooth, sticky when moist, with more or less distinct radiate wrinkles, convex to plane or recurved, with a distinct disk; stem tall, 10-20 cm. by 1-2 cm., usually like the cap in color but paler, smooth or mealy, often grooved, tapering upward and with a long tapering root at the base; gills adnexed or sinuate, white, broad and distant; spores elliptic, 15-17 $\times$ 10$\mu$. The name refers to the long, rooting stem.

Solitary or in open groups, on the ground in leaf-mold or in grass, more rarely on greatly decayed stumps, May to frost; edible, with a sweet, delicate flavor.

FIGURE 15. COLLYBIA RADICATA

### Collýbia platyphýlla Broad Gill

Cap medium, 7-11 cm. wide, whitish, ashen or brown-smoky, smooth or with fibrils, watery, but not sticky when moist, convex at first, then flat and more or less concave; stem tall and thick, 7-11 cm. by 1-2 cm., whitish or grayish, smooth or streaked with fibers, stuffed, with a short root at base; gills adnexed or sinuate, white, distant, very broad, 1-2 cm.; spores elliptical, 10-17 $\times$ 6-12$\mu$. The name refers to the broad gills.

Solitary or in groups, on the ground or decaying wood in forest and woodland, May to October; edible, but not as desirable as the two preceding.

### Collýbia velútipes Velvet Stem

Cap small to medium, 2-8 cm. wide, yellow-brown or reddish brown, rarely paler except toward the margin, smooth, very sticky when moist, convex to plane or somewhat recurved, often excentric or irregular through mutual pressure; stem rather short, 3-8 cm. by 2-8 mm., yellow above, brown or nearly black below, densely velvety, tough, stuffed or hollow; gills adnexed or slightly sinuate, yellowish to yellow; spores ellipsoid, 6-7 $\times$3-4$\mu$. The name refers to the velvety stem, especially the lower part.

In dense clusters on stumps and logs, more rarely on the ground when it contains much woody matter, or in decayed spots in living trees. It is most abundant in the fall, but it may appear during any month of the year. It is one of the very best of edible species.

### Collýbia cónfluens Twin Stem

Cap small, 2-3 cm. wide, reddish-brown or reddish, smooth, watery when moist, convex or flat to somewhat depressed or upturned; stem slender, 8-14 cm. by 2-4 mm., paler than the cap but of the same color, covered with a dense white down, tough, hollow; gills free, whitish or grayish, narrow, crowded; spores subglobose to ovate, 6-9 $\times$ 4-7$\mu$. The name refers to the fact that the stems often grow together.

Growing in dense tufts on the ground in woodland, more rarely in grassland; excellent, readily preserved by drying for winter use.

### Collýbia dryóphila Oak Collybia

PLATE I: 5

Cap small to medium, 2-7 cm. wide, usually tan to brown, but varying from whitish through yellow to red-brown or dark brown, smooth, convex to plane or somewhat depressed; stem 3-8 cm. by 3-8 mm., usually yellowish or reddish-brown, tough, smooth, hollow, sometimes rooting at the base; gills sinuate or adnexed, whitish or rarely yellowish, narrow, crowded; spores ellipsoid or ovoid, 5-7 $\times$ 4-5$\mu$. The name refers to the habit of growing in woods.

Common in woods, May to frost; edible and of good quality.

## MYCENA

This genus differs from Collybia in having the margin of the cap straight in the young plant instead of incurved. It is separated from Omphalia by the insertion of the gills, which are adnate or adnexed but never decurrent and by the conic or bell-shaped cap. These are typically small graceful plants, often of most beautiful coloring. It is probable that all the species are edible, but they are usually neglected on account of the small size. The name means mushroom.

FIGURE 16. COLLYBIA VELUTIPES

## Key to the Species

1. Plant with a strong alkaline odor — *M. alcalina*
2. Plant without a strong alkaline odor
   a. Cap bright-colored, rose, lilac, blue or yellow — *M. pura*
   b. Cap gray, yellowish or brown
      (1) Cap 1-5 cm. wide
         (a) Cap striate to the disk, conic bell-shaped; gills more or less tinged with pink — *M. galericulata*
         (b) Cap slightly striate at margin, convex; gills white — *M. prolifera*
      (2) Cap 4-9 mm. wide — *M. vulgaris*

### Mycéna alcalína Strong Mycena

Cap small, 2-5 cm. wide, whitish, grayish, yellowish or brownish, smooth, shining when dry, deeply striate, bell-shaped; stem slender, 5-8 cm. by 2-4 mm., grayish or yellowish, smooth, shining, woolly at base, hollow; gills adnate, whitish to yellowish; spores subglobose, 8-10 × 5-7$\mu$. The name refers to the characteristic alkaline odor.

In clusters on stumps, trunks and even on leaves, but rarely if ever on the ground, late summer and autumn; probably edible but to be tested with care.

### Mycéna púra Color Cap

PLATE I: 6

Cap small, 2-4 cm. wide, rose, lilac, blue, yellow or rarely pure white, smooth, margin finely striate, bell-shaped to convex or almost flat; stem slender, 5-10 cm. by 2-4 mm., usually of the color of the cap, smooth, somewhat hairy at the base, hollow; gills adnate or sinuate, rose, lilac or white, connected by veins; spores ellipsoid, 6-8 × 4$\mu$. The name refers to the bright color of the cap.

Solitary or in groups or clusters on the ground, common in moist woods in late summer and autumn; probably edible.

### Mycéna galericuláta Cowl Mycena

Cap small, 1-5 cm. wide, gray, yellowish-gray to brown, varying greatly, smooth, distinctly striate to the disk, conic-bellshaped; stem slender, 5-12 cm. by 2-4 mm., whitish, grayish or brownish, smooth, shining, hairy and rooting at the base, hollow; gills adnate, white, tinged with pink or red, connected by veins; spores subglobose, 9-10 × 6-8$\mu$. The name refers to the cowl-shaped cap.

Usually in clusters on stumps, logs and twigs, the stems held together by matted hairs at the base, during summer and autumn; said by McIlvaine to be pleasant.

### Mycéna prolífera Tufted Mycena

Cap small, 1-3 cm. wide, pale yellowish to tan or brown, darker on the disk, smooth, slightly striate at the margin, convex or nearly flat when mature; stem slender, 5-8 cm. by 2-4 mm., pale above, tan to brownish below, smooth, shining, rooted; gills adnexed, whitish; spores elliptic, 8-10 × 5-7$\mu$. The name refers to the dense tufts.

In grass or on trunks, in late summer and autumn; excellent.

### Mycéna vulgáris

Cap very small, 4-9 mm. wide, whitish, grayish or smoke-colored, smooth, sticky, striate at the margin, convex, depressed in the middle; stem thread-like, 2-6 cm. by 1-2 mm., ashen or dark, sticky, tough, hollow, hairy and rooted at base;

FIGURE 17. MYCENA GALERICULATA

gills decurrent, white; spores ellipsoid, 3-4 × 2$\mu$. The name refers to the frequence.

In groups and clusters on leaves, twigs, etc., in woods, during summer and autumn; probably edible, but too small to be of account. The umbilicate cap and decurrent gills indicate that the proper position of this plant is in Omphalia.

#### OMPHALIA

This is closely related to Mycena, but the majority of the species are easily recognized by the decurrent gills and the typically depressed or umbilicate cap. Mycena vulgaris, however, possesses both these features, and will be sought under this genus, where it properly belongs. The species are very small for the most part; they are edible, but too small to be important. The name refers to the depressed or funnel-form cap.

### Key to the Species

1. Cap whitish; gills whitish, distant — *O. umbellifera*
2. Cap rust-colored; gills yellow or yellowish, close — *O. campanella*

### Omphália umbellífera Umbel Cup

Cap small 1-3 cm. wide, whitish or grayish, smooth, watery-translucent, striate, convex, plane and finally depressed; stem slender, 1-3 cm. by 2 mm., whitish, usually smooth, hairy at the base, stuffed or hollow; gills decurrent, whitish, broad, distant; spores subglobose to ellipsoid, 8-10 × 5-6$\mu$. The name refers to the shape of the cap.

Common on decaying wood or on ground containing much decayed wood, summer and autumn; edible, but scarcely desirable.

### Omphália campanélla Bell Cup

Cap small, 6-15 mm. wide, rust-colored, smooth, watery-translucent, somewhat striate, bell-shaped or convex, depressed in the middle; stem slender, 3-6 cm. by 2 mm., brown, smooth, hairy at the base, hollow; gills decurrent, yellow or yellowish, connected by veins, close; spores elliptic 6-7 × 3-4$\mu$. The name refers to the bell-shaped cap.

In clusters on decaying logs and stumps, especially of conifers, rarely on the ground, summer and autumn; edible.

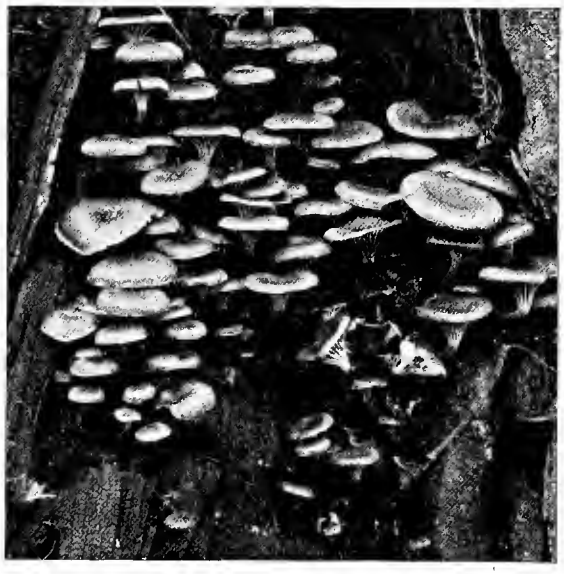

FIGURE 18. OMPHALIA CAMPANELLA

### PLEUROTUS

This genus is characterized by an excentric or lateral stem; the stem is entirely lacking in some species, and the cap is shelf-like, or is turned upside down. Pleurotus resembles Tricholoma and Clitocybe in structure; but is readily recognized as a rule by the absence of a central stem, and by its habit of growing on wood. This is one of the most satisfactory of genera from the standpoint of the mushroom-eater. The species are common, usually grow in large masses throughout the entire growing period, and are of excellent flavor. The name refers to the excentric or lateral stem.

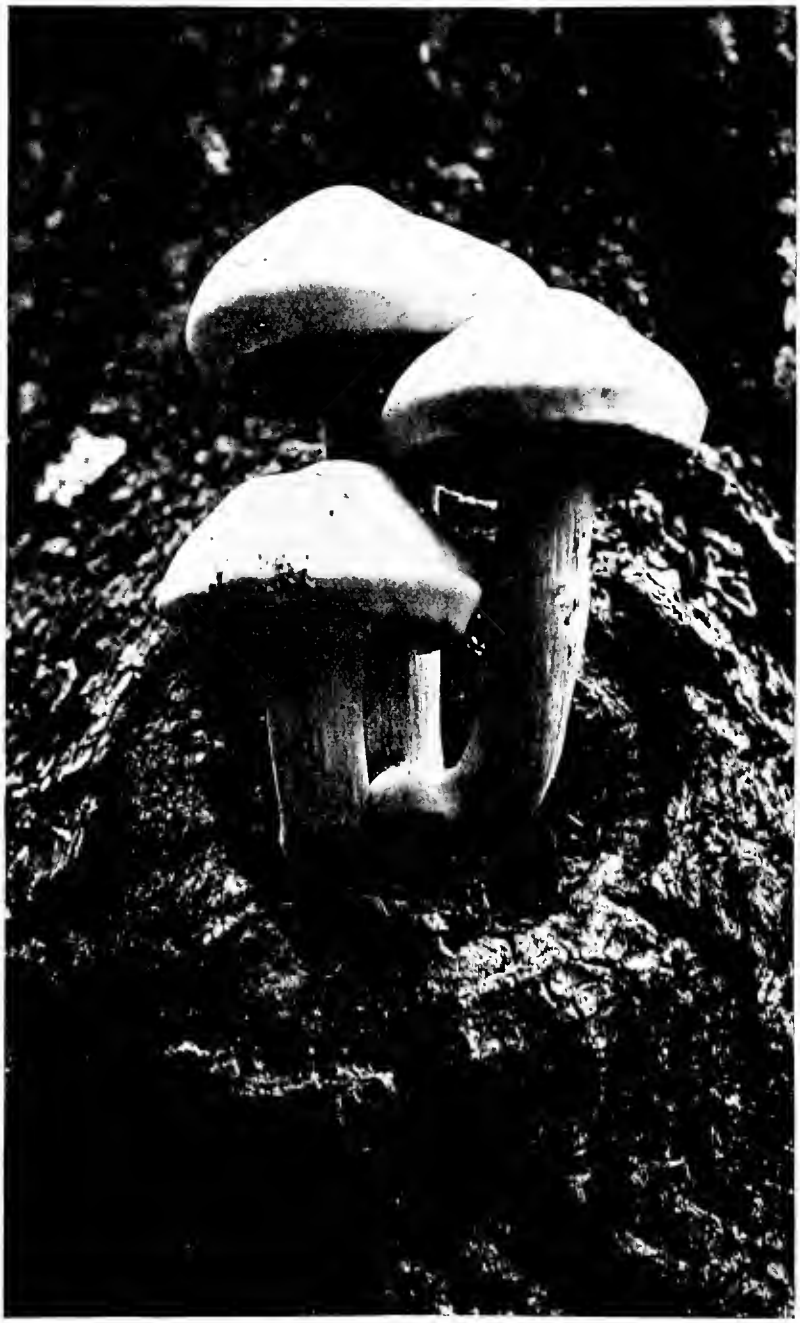

FIGURE 19. PLEUROTUS ULMARIUS

## Key to the Species

1. Gills beneath the cap or lateral
   a. Stem distinct, excentric; gills adnexed or sinuate — *P. ulmarius*
   b. Stem lateral or disappearing; gills decurrent
      (1) Cap horizontal or shelf-like
         (a) Spores white — *P. ostreatus*
         (b) Spores lilac-tinged against a white background — *P. sapidus*
      (2) Cap more or less erect and spatula-like — *P. petaloides*
2. Gills on the upper side, i. e., the cap reversed — *P. applicatus*

FIGURE 20. PLEUROTUS OSTREATUS

### Pleurótus ulmárius Elm Cap

Cap large, 8-15 cm. wide, white, whitish or tan, often brownish toward the center, smooth, often cracked, usually convex, sometimes plane; stem long and stout, often nearly central, 5-12 cm. by 2-3 cm., white or tan, smooth or hairy toward the base, solid, elastic, often curved; gills adnexed or sinuate, whitish, broad, close; spores globose, 5-6$\mu$. The name refers to its fondness for the elm.

Frequent in towns and cities on the trunks of living trees, especially elms, growing from injuries or knot-holes, often 20-30 feet from the ground, late summer until severe frosts. The flesh is firm, or in old specimens quite tough, but the flavor makes this one of the best of the edible species.

### Pleurótus ostreátus Oyster Cap

Cap large, 7-24 cm. wide, white, gray or tan, smooth or more or less scaly in age, convex or plane, shelf- or shell-shaped, more or less lobed and torn at the margin; stem short and lateral, or none, white, solid, more or less hairy at base; gills long-decurrent, connected by veins on the stem, white or yellowish; spores elliptic, 8-10 × 4-5$\mu$. The name refers to the shell- or oyster-shaped cap.

Overlapping in dense clusters on stumps and trunks, spring to autumn; somewhat tough but of excellent flavor.

### Pleurótus sápidus Shell Cap

Cap large, 5-12 cm. wide, white to gray, tan or brownish, smooth, convex or flat, shell-shaped; stem short, strongly excentric or lateral or none; gills long-decurrent, whitish or yellowish; spores elliptic, lilac-tinted in mass, 8-12 × 4-6$\mu$. The name refers to the savory nature of the cap.

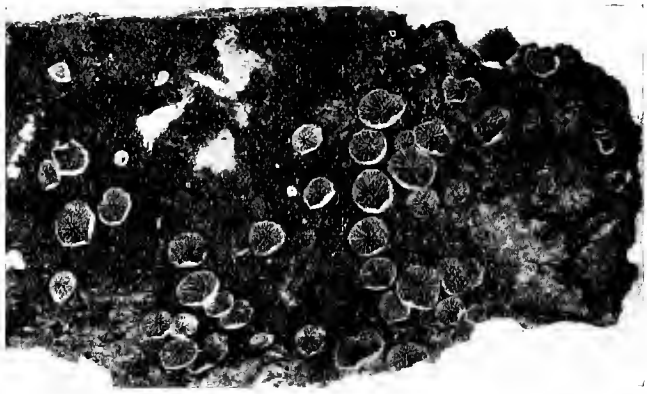

FIGURE 21. PLEUROTUS APPLICATUS

This can be distinguished from the Oyster Cap only by the lilac tint of the spores. To the beginner, there is no important difference between them.

### Pleurótus petaloídes Petal Cap

Cap small to medium, 3-10 cm. long by 1-5 cm. wide, brownish or reddish-brown or sometimes whitish, smooth, wedge-shaped, shell-like or spatula-like; stem short, 1-2 cm. tall, whitish, more or less hairy; gills long-decurrent, white or gray, narrow and crowded, dotted with bristles or cystidia; spores elliptic, 8-9 × 4$\mu$. The name refers to the shape of the cap.

In clusters on stumps, on branches or roots buried in the ground, late summer and autumn; edible.

### Pleurótus applicátus Inverted Pleurotus

Cap very small, 3-7 mm. wide, gray, bluish-gray or blackish, smooth or hairy, usually inverted, more rarely shelf-like, saucer-shaped; stem lacking; gills gray

or bluish-gray, radiating; spores globose, 4-5$\mu$. The name refers to the position of the cap.

Frequent on decaying logs or branches, often buried in the soil.

### RUSSULA

Closely related to Lactarius, from which it differs in the absence of milky sap. It is characterized by the very brittle cap and stem, by the swollen, cell-like threads of the middle of the gills, the trama, and by globose spiny spores. The beginner is perhaps most likely to confuse Russula with Tricholoma, but the features indicated are decisive. Many species of this genus have long been regarded as harmful, if not downright poisonous, but McIlvaine insists that not a single species is known to be poisonous, and that all those which are not too highly flavored are desirable. The name refers to the red color of many species.

## Key to the Species

1. Cap typically red or yellow
   a. Cap red, rarely yellowish or white
      (1) Gills white — *R. emetica*
      (2) Gills yellowish or yellow
         (a) Cap rose-red, sticky, striate; taste mild — *R. roseipes*
         (b) Cap vermilion, dry, not striate; taste very biting — *R. rubra*
   b. Cap yellow, rarely red
      (1) Gills whitish; smell heavy and unpleasant; taste biting — *R. foetens*
      (2) Gills yellow, at least the edge; smell and taste pleasant
         (a) Gills whitish, bright yellow at the edge — *R. aurata*
         (b) Gills entirely yellow — *R. lutea*
2. Cap not red or yellow; white, brown, green or blackish
   a. Cap white or whitish to brown or black
      (1) Cap soot-colored to black; flesh reddening when touched — *R. nigricans*
      (2) Cap white to brown, rarely black; flesh not reddening
         (a) Taste mild
            x. Cap, stem and gills white — *R. delica*
            y. Cap, stem and gills grayish to smoke-colored — *R. adusta*
         (b) Taste biting
            x. Cap sticky, furrowed at the margin; flesh not changing — *R. pectinata*
            y. Cap dry, not furrowed; flesh turning blackish when wounded — *R. sordida*
   b. Cap green or greenish, rarely paler — *R. virescens*

### Rússula emética Scarlet Cap

PLATE I: 9

Cap medium, 5-12 cm. wide, bright or deep red, rarely yellow or whitish, smooth, more or less furrowed at the margin, convex, flattened or slightly depressed; stem stout, 4-6 cm. by 1-2 cm., white, or tinged with red, smooth, spongy; gills nearly free, white, broad; spores globose, spiny, 8-10$\mu$. The name refers to its supposed properties.

Common in forest and woodland during summer and autumn; very acrid and commonly reputed to be poisonous, but said by McIlvaine to be harmless.

### Rússula roséipes Rosy Stem

Cap small, 3-6 cm. wide, rose-red, tinged with other colors, smooth, sticky, striate at the margin, convex to plane or slightly depressed; stem stout, 3-7 cm. by 8-15 mm., white tinged with red, smooth, stuffed or somewhat hollow; gills more or less adnexed, whitish then yellow; spores subglobose, yellowish, spiny, 8-10$\mu$. The name refers to the rosy stem.

On ground, usually in coniferous woods, late summer and autumn; excellent.

### Rússula rúbra Red Russula

Cap medium, 6-11 cm. wide, vermilion, bright and shining, rarely paler, smooth, dry, convex or flat, often depressed; stem stout, 5-8 cm. by 2-3 cm., white or reddish, solid; gills adnate, yellowish or yellow, often red on the edge; spores globose, spiny, 8-10$\mu$. The name refers to the color.

On the ground in woods, summer and autumn; very acrid, but edible.

### Rússula foétens Fetid Russula

Cap medium to large, 8-14 cm. wide, dull or dingy yellow, smooth, sticky when moist, striate-warty at the margin, convex to flat and depressed; stem stout, 4-7 cm. by 1-2 cm., whitish, stuffed or hollow; gills adnexed, whitish, more or less forked or connected by veins; spores globose, spiny, 8-11$\mu$. The name refers to the unpleasant odor.

On ground in woods, during summer and autumn; odor and taste both disagreeable, though McIlvaine states that the plant is not actually poisonous.

### Rússula auráta Golden Russula

Cap small to medium, 4-8 cm. wide, bright yellow or orange, rarely red, smooth, sticky when wet, even at the margin, or striate or wrinkled when old, bell-shaped to convex or flat; stem stout, 5-8 cm. by 1-2 cm., white or bright yellow, solid or spongy; gills free, whitish or yellowish, but bright yellow on the edge, broad; spores globose, spiny, 8-10$\mu$. The name refers to the color.

In woodlands or grassland, summer and autumn; smell and taste pleasant, edible.

### Rússula lútea Yellow Russula

Cap small, 2-5 cm. wide, yellow, rarely paler or white, smooth, sticky when wet, convex to plane or depressed; stem short and stout, 3-4 cm. by 1 cm., white, stuffed or hollow; gills free or nearly so, yellow, narrow and crowded; spores yellowish, spiny, globose, 7-10$\mu$. The name refers to the color.

On the ground in woods, late summer and autumn; edible.

### Rússula nígricans Black Russula

Cap medium, 5-12 cm. wide, smoky or sooty, or finally black, smooth or more or less cracked, somewhat sticky at first, convex or flat, finally funnel-shaped, flesh reddening when broken; stem stout, 5-8 cm. by 2-3 cm., more or less black, solid; gills more or less adnexed, grayish or smoky, reddening when touched; spores globose, spiny, 6-9$\mu$. The name refers to the color.

On the ground in woods, spring, summer and fall; mild in taste, edible.

### Rússula délica White Russula

PLATE I: 10

Cap large, 7-14 cm. wide, whitish, smooth, depressed then funnel-shaped, the margin turned in; stem short and stout, 2-5 cm. by 1-2 cm., white, smooth, solid; gills decurrent, white, narrow and distant; spores globoid, spiny, 8-11 $\times$ 6-9$\mu$. The name refers to the lack of milk.

On the ground in woods, during summer and autumn; taste mild; edible, but only fair.

### Rússula adústa Smoky Russula

Cap large, 8-16 cm. wide, grayish or soot-colored, smooth, depressed to funnel-form; stem very short and stout, 2-3 cm. by 1-2 cm., smoky, solid; gills adnate or decurrent, whitish or grayish, crowded; spores globose, spiny, 8-11$\mu$. The name refers to the color.

On the ground in woods, from midsummer to frost; edible and well-flavored.

### Rússula pectináta Ribbed Russula

Cap medium, 4-8 cm. wide, yellowish-brown to tan or rarely paler, smooth, sticky at first, convex or flat, then depressed or funnel-form, the margin deeply ribbed or grooved; stem short and stout, 3-4 cm. by 2-3 cm., white, stuffed; gills tapering and free, white, crowded; spores subglobose, spiny, 8-11$\mu$. The name refers to the comb-like margin.

On the ground in woodland and grassland, during summer and autumn; not poisonous, but of strong unpleasant flavor.

### Rússula sórdida Dingy Russula

Cap medium to large, 7-12 cm. wide, dirty white to brownish, smooth, dry, convex or flat, depressed in the center, flesh blackening when wounded; stem stout,

4-9 cm. by 1-2 cm., dirty white, solid; gills adnexed, white; spores globose, 7-8$\mu$. The name refers to the color.

On the ground in woods, late summer to autumn; edible and of fair quality.

### Rússula viréscens Green Russula

Cap medium to large, 8-12 cm. wide, gray-green to dark green, rarely paler, smooth, dry, often cracked into scales or warts, bell-shaped to flat and depressed; stem 6-8 cm. by 1-2 cm., white, spongy; gills free, white, crowded; spores globoid, spiny, 6-9$\mu$. The name refers to the green color.

In woodland and grassland, from July to frost; one of the best of the Russulas.

## LACTARIUS

Differing from Russula only in the presence of a white or colored milky juice, a feature which distinguishes it also from practically all other gill-fungi. It agrees with Russula in its brittle texture, and in its globoid spiny spores. Many of the species are regarded as poisonous, but McIlvaine insists that many of them have been condemned without trial on account of their pungent taste or highly colored milk. The pungency usually disappears on cooking, however, and some of the best edible species have a bright-colored milky sap. The name refers to the presence of milk.

### Key to the Species

1. Milk bright-colored, usually yellow or orange
   - a. Milk orange-red; flesh turning green when wounded — *L. deliciosus*
   - b. Milk white, then golden; flesh not turning green — *L. chrysorrheus*
2. Milk white, not becoming bright-colored
   - a. Cap downy or hairy, at least on the margin
     - (1) Cap downy or velvety throughout; white or whitish — *L. vellereus*
     - (2) Cap hairy or shaggy on the margin; tan tinged with red — *L. torminosus*
   - b. Cap not downy or hairy
     - (1) Cap sticky
       - (a) Cap yellowish, zoned; gills whitish — *L. insulsus*
       - (b) Cap reddish or brownish-red, scarcely zoned; gills yellowish — *L. hysginus*
     - (2) Cap not sticky
       - (a) Cap white; gills whitish, with occasional yellow spots — *L. piperatus*
       - (b) Cap tawny to orange; gills white or yellowish, brownish when wounded — *L. volemus*

### Lactárius deliciósus Orange Flow

Cap small to medium, 3-10 cm. wide, reddish-yellow, orange or brick-colored, smooth, sometimes slightly sticky, usually distinctly zoned, plane, then depressed and

FIGURE 22. LACTARIUS DELICIOSUS

more or less funnel-form; stem stout, 4-8 cm. by 1-2 cm., colored like the cap or somewhat paler, smooth, stuffed, finally hollow; gills decurrent, deep yellow, narrow and crowded; spores globoid, spiny, 7-10$\mu$. Cap, stem and gills turn orange, and then green wherever wounded; milk orange, fragrant. The name refers to the edible properties.

Common on the ground in woods, July to October; one of the best of edible fungi.

### Lactárius chrysórrheus Golden Flow

Cap medium to large, 5-18 cm. wide, yellowish, tinged with pink or red, more or less zoned or marked with dark spots, little or not at all sticky, depressed and finally more or less funnel-form; stem stout, 4-8 cm. by 1-2 cm., paler than the cap, or whitish, smooth, stuffed or hollow; gills decurrent, yellowish, crowded; spores globose, 7-8$\mu$; milk white, then golden, biting. The name refers to the golden milk.

On the ground in woods from July to frost; not known to be edible.

### Lactárius velléreus Downy Lactarius

Cap medium to large, 5-15 cm. wide, white or whitish, velvety or downy, zoneless, plane to depressed or funnel-form; stem short and very stout, 3-6 cm. by 2-4 cm., whitish, finely hairy, solid; gills decurrent, whitish, then more or less yellowish, distant; spores ellipsoid, scarcely spiny, 8-9 $\times$ 5$\mu$; milk white, biting. The name refers to the downy cap.

On the ground in woodland and grassland, summer and autumn; often reputed poisonous, but eaten by McIlvaine and others.

### Lactárius torminósus Shaggy Lactarius

PLATE I: 8

Cap small to large, 2-14 cm., yellowish or tan, tinged with pink or red, sometimes zoned or spotted, the margin shaggy with long hairs, which often extend over the cap, depressed to funnel-form; stem short and stout, 3-6 cm. by 1-2 cm., whitish, finely hairy, hollow; gills decurrent, whitish, spotted with yellow or pink, crowded; spores globoid, spiny, 10-12 $\times$ 8$\mu$; milk white, acrid. The name refers to the supposed poisonous effects.

Common on ground in woods, more or less hidden beneath the leaves, during summer and autumn; reputed to be poisonous, but this is disputed by many.

### Lactárius insúlsus Tasteless Lactarius

Cap medium, 5-10 cm. wide, yellowish, sticky, more or less zoned, plane to depressed, then funnel-shaped; stem stout, 4-8 cm. by 1-2 cm., whitish or yellowish, somewhat spotted, hollow; gills decurrent, whitish, crowded; spores globoid, 7-9$\mu$; milk white, acrid. The name means tasteless.

In woodland and grassland, late summer and autumn; edible.

### Lactárius hýsginus Reddish Lactarius

Cap medium, 5-10 cm. wide, reddish, brownish-red or rarely paler, smooth, sticky, scarcely zoned, depressed and more or less funnel-form; stem 3-8 cm. by 1-2 cm., reddish or paler, sometimes spotted, smooth, hollow; gills decurrent, whitish, then yellowish, crowded; spores globoid, 8-10$\mu$; milk white, biting. The name refers to the reddish color.

On the ground in woods, July to October; edible.

### Lactárius piperátus Pepper Cap

Cap large, 10-20 cm. wide, white, smooth, dry, zoneless, depressed to funnel-form; stem short and stout, 3-8 cm. by 2-4 cm., whitish, smooth, solid; gills decurrent, whitish with occasional yellow spots, narrow and crowded, forking in pairs; spores subglobose, spiny, 7-9$\mu$; milk white, very pungent. The name refers to the peppery milk.

Common in woodland and grassland, July to frost; edible.

### Lactárius volémus Orange Lactarius

Cap medium, 4-12 cm. wide, tawny to orange, smooth, dry, sometimes chinky, plane or depressed; stem stout, 3-10 cm. by 2 cm., colored like the cap or paler, smooth, solid; gills decurrent, white or yellowish, becoming dark or brownish when wounded, crowded; spores globose, spiny, 8-10$\mu$; milk white, acrid. The name refers to the shape of the cap.

Common in woods, from midsummer to frost; delicious.

## HYGROPHORUS

This genus has no clearly marked characteristics to the beginner. It is based upon the waxy surface of the gills at maturity, but this feature is not readily seen until the plant is mature, and it varies considerably in different species. The fact that the gills broaden from the edge backward into the flesh of the cap, and that they are usually distant aids in the recognition of this genus. The watery or translucent appearance of the gills also aids in identification. The cap is often sticky, and beautifully colored. All of the species tested are edible. The name refers to the watery texture.

### Key to the Species

1. Gills decurrent or with a decurrent tooth
   a. Cap sticky when moist
      (1) Whole plant ivory white — *H. cburneus*
      (2) Plant reddening or bright red
         (a) Cap white, then red; stem and gills white with red spots — *H. erubescens*

(b) Cap bright red; stem red above, yellow below; gills yellowish — *H. coccineus*

b. Cap not sticky, yellowish; gills white to tawny — *H. pratensis*

2. Gill not decurrent, but adnate, adnexed or free

a. Gills adnate

(1) Cap and stem covered with a greenish slime — *H. psittacinus*

(2) Cap and stem without a greenish slime — *H. miniatus*

b. Gills merely touching or free

(1) Gills touching; cap bell-shaped to convex — *H. puniceus*

(2) Gills mostly free; cap conical — *H. conicus*

### Hygróphorus ebúrneus Ivory Watercap

Cap small to medium, 4-8 cm. wide, ivory white, very sticky when wet, convex to plane or upturned; stem 4-12 cm. by 4-8 mm., white, sticky, dotted above with tiny scales, stuffed, then hollow; gills decurrent, white, darkening in drying, distant; spores subglobose, 5-6$\mu$. The name refers to the ivory whiteness.

In woodland and grassland, late summer and autumn; edible, well-flavored but somewhat tough.

FIGURE 23. HYGROPHORUS EBURNEUS

### Hygróphorus erubéscens Reddish Watercap

Cap medium, 5-10 cm. wide, white, then becoming rosy-red throughout, sticky, dotted-scaly or smooth, convex or plane; stem rather stout, 5-12 cm. by 1-2 cm., white, with red spots or fibrils, solid; gills decurrent, white, reddened in spots, distant; spores ellipsoid, 8-10 $\times$4-5$\mu$. The name refers to the reddening of the whole plant.

On the ground in woods, often in fairy rings, late summer and autumn; edible.

### Hygróphorus coccíneus Scarlet Watercap

Cap small, 2-5 cm. wide, bright red, paler with age, sticky, smooth, convex to plane; stem short, 4-5 cm. by 1 cm., red above, yellow below, smooth, hollow; gills decurrent by a tooth, yellowish, reddish at base, connected by veins, distant; spores ellipsoid, 6-8 $\times$ 4-5$\mu$. The name refers to the scarlet cap.

Usually in groups in woodland and grassland, in summer and autumn; excellent.

### Hygróphorus praténsis Water Top

C a p small to medium, 3-10 cm. wide, yellow, yellowish or whitish, moist but not sticky, smooth, convex or flattened, then shaped like a top; s t e m short, 3-5 cm. by 1-2 cm., tawny or whitish, tapering toward the base, smooth, stuffed; g i l l s long-decurrent, yellowish or whitish, connected by veins at the base, distant; s p o r e s ellipsoid, 7-10 × 4-6μ. The name refers to its habit of growing in meadows and pastures.

In grassland, often in tufts or rings, late summer and autumn; excellent.

### Hygróphorus psittacínus Green Slimecap

C a p small, 2-4 cm. wide, usually yellow, but varying to red, brown or white, typically covered with a green slime, smooth, striate, bell-shaped to plane or more or less depressed; s t e m somewhat slender, 5-8 cm. by 3-4 mm., colored much like the cap, but the green slime most persistent at the top, smooth, hollow; g i l l s adnate, more or less greenish, broad and distant; s p o r e s ellipsoid, 7-8 × 5-6μ. The name refers to the parrot-like color.

In woodland and grassland, summer and autumn; probably edible.

### Hygróphorus miniátus Vermilion Watercap

C a p small, 1-4 cm. wide, vermilion red, rarely red-yellow or yellow, not sticky, usually smooth, convex to plane; s t e m short, slender, 2-5 cm. by 2 mm., usually red, polished, more or less stuffed; g i l l s adnate, yellow, or tinged with red, distant; s p o r e s elliptic, 8 × 6μ. The name refers to the color of the cap.

Common in woods, and in grassland, July to frost; excellent.

### Hygróphorus puníceus Blood Cap

C a p small to medium, 3-12 cm. wide, blood-red, paler in age, sticky, smooth, bell-shaped to flat or depressed; s t e m 8 cm. by 1-2 cm., yellow or red above, but always white at the base, striate, hollow; g i l l s adnexed, yellow, broad and distant; s p o r e s elliptic, 10 × 4-5μ. The name refers to the color of the cap.

In grassland, summer and autumn; edible.

### Hygróphorus cónicus Red Cone

PLATE I: 7

C a p small, 1-4 cm. wide, red, vermilion, orange or yellow, blackening as it dries, sticky when moist, shining, smooth, conic, though more or less expanded and lobed at the margin in age; s t e m slender, 5-10 cm. by 4-8 mm., colored like the cap or paler, striate, hollow; g i l l s free, yellow, distant; s p o r e s ellipsoid, 10 × 6-8μ. The name refers to the shape of the cap.

Common in woodland and thicket, during summer and autumn; edible.

CANTHARELLUS

Related to Hygrophorus, but distinguished from it and all the preceding by the gills, which are obtuse and vein-like, instead of plate-like. The cap is more or less top-shaped or funnel-form, and typically yellow to orange in our species. Both species are edible, according to McIlvaine. The name refers to the vase-like form.

### Key to the Species

1. Cap bright yellow, smooth — *C. cibarius*
2. Cap orange to brownish-orange, somewhat hairy or silky — *C. aurantiacus*

### Cantharéllus cibárius Yellow Chanterelle

Cap 3-8 cm. wide and high, light or bright yellow, smooth, convex to plane or somewhat depressed and top-shaped, often irregular and one-sided; stem short

FIGURE 24. CANTHARELLUS CIBARIUS

and stout, 2-3 cm. by 1-2 cm., yellow, tapering downward, solid; gills thick and obtuse, running down the stem, yellow, more or less branched and united, distant; spores ellipsoid, 8-10 × 5-6$\mu$. The name refers to the great value of the plant as food.

In woodland and grassland, in summer and early autumn; famed since the earliest times as one of the most delicious of mushrooms.

### Cantharéllus aurantíacus Orange Chanterelle

Cap 3-8 cm. wide and high, dull orange, brownish on the disk or somewhat brown-orange all over, finely silky, convex to plane and funnel-form, the margin

more or less strongly incurved; stem 5-6 cm. by 4-8 mm., tan to deep yellow, stuffed; gills running down the stem, thick and much branched and united, yellow or orange; spores globoid, 5-7 × 3-4μ. The name refers to the color.

On the ground in woods and meadows, from midsummer to frost; said to be edible by McIlvaine.

### MARASMIUS

Closely related to Collybia and Mycena, but readily distinguished in most cases by the tougher, leathery or membranous cap, which revives after withering. A few species might be placed equally well in two of the genera, and the beginner will find it necessary to seek such species in both places. The stem is tough and slender, and the gills are acute at the edge and variously attached to the stem. It is probable that all the species are edible, though many are too small to be of value. The name refers perhaps to the fact that the plant withers but does not decay.

#### Key to the Species

1. Cap even, not distinctly furrowed; leathery
   a. Stem hairy at base; taste biting
      (1) Stem hairy throughout, densely white-downy at base — *M. urens*
      (2) Stem smooth, but densely hairy at base — *M. peronatus*
   b. Stem smooth or hairy, but not densely hairy at base; taste mild
      (1) Stems smooth and shining, fastened in dense clusters by threads at the base — *M. cohaerens*
      (2) Stems velvety throughout, not fastened together by threads — *M. oreades*
2. Cap deeply ridged or furrowed; very thin, papery
   a. Gills attached to a collar free from the stem — *M. rotula*
   b. Gills without a collar, free or adnate
      (1) Cap white, pellucid; gills adnate — *M. nigripes*
      (2) Cap pink or tan-red; gills free or touching — *M. siccus*

#### Marásmius úrens Pungent Marasmius

Cap small to medium, 3-7 cm. wide, yellowish, tan or paler, smooth, or somewhat cracked, convex to plane, the margin often incurved; stem slender, tough, 6-14 cm. by 5-6 mm., pale, covered with fine white hairs, more or less white-woolly at the base, solid; gills free, pale to yellowish or brownish, distant; spores globoid, 3-4 × 2-3μ. The name refers to the burning taste.

Common in woods from spring to autumn, more or less clustered or grouped; one of the mushrooms poisonous to some persons and not to others, and hence to be avoided except by the experimenter.

### Marásmius peronátus Boot Stem

C a p small to medium, 3-8 cm. wide, yellowish, tan or pale brownish red, smooth, striate at the margin, convex to flat; s t e m slender and tough, 5-8 cm. by 3-4 mm., whitish or yellowish, with a downy covering which separates readily, densely yellowish or white-woolly at the base, stuffed, then hollow; g i l l s adnexed, then free, pale to reddish; s p o r e s ovoid, 6-8 × 3-5$\mu$. The name refers to the sheath-like down at the base of the stem.

Common on the ground in woods, June to frost; acrid, but highly flavored and delicious when cooked.

FIGURE 25. MARASMIUS OREADES

### Marásmius cohaérens Tuft Marasmius

C a p small, 2-3 cm. wide, tan, yellow to reddish brown, smooth, striate when moist, convex to plane or upturned; s t e m tall and slender, 10-20 cm. by 4-6 mm., colored like the cap, but shining, or paler, hollow, fastened together near the base by threads; g i l l s adnate, more rarely free, tan to red-brown, with spindle-shaped, yellow-brown spines, 60-90$\mu$; s p o r e s elliptic, 6 × 3$\mu$. The name refers to the fused bases of the stems.

On the ground among leaves and in much-decayed wood, late summer and autumn.

### Marásmius oréades Fairy-ring Mushroom

C a p small, 2-5 cm. wide, reddish to tan or paler, smooth, more or less striate on the margin when wet, convex to plane or upturned; s t e m 2-8 cm. by 4-6 mm., whitish, smooth at the base, downy above, solid; g i l l s free, whitish or cream-colored, broad and distant; s p o r e s ellipsoid, 7-9 × 4-6$\mu$. The name refers fancifully to the habit of growing in fairy rings.

On the ground in grass, forming rings which widen from year to year, though the circles are often incomplete from various causes, appearing from spring to frost; delicious, especially adapted to preservation by drying.

### Marásmius rótula Wheel Cap

C a p very small, 2-6 mm. wide, white all over, or somewhat darker on the disk; smooth, papery, deeply furrowed, sunken in the center, more or less convex; s t e m

FIGURE 26. MARASMIUS ROTULA

thread-like, 2-3 cm. by ½-1 mm., dark-brown or blackish, smooth, shining, hollow; g i l l s few, joined behind to a collar which is free from the stem, whitish, broad and distant; s p o r e s elliptic, 6-8 × 3-4$\mu$. The name refers to the wheel-like cap.

Common on leaves and twigs in forests, rarely in the soil, from spring to autumn; too small for its edibility to be of importance.

### Marásmius nígripes Blackstem

C a p very small, 2-10 cm. wide, pure white, transparent or jelly-like, deeply furrowed, umbonate, convex to flat; s t e m thread-like, broader upward, 2-3 cm.

by ½-1 mm., more or less white-powdered, then black; gills adnate, whitish, somewhat branched; spores star-shaped. The name refers to the black stems.

On leaves and twigs in woods, July to October.

### Marásmius síccus Pinwheel

Cap small, 1-3 cm., rose or yellow-red, papery, smooth, deeply furrowed from the darker center, conic or bell-shaped for the most part, sometimes convex; stem tall, thread-like, 5-8 cm. by 1-2 mm., blackish-brown or black, smooth, shining, hollow; gills free or nearly so, whitish, broad and distant. The name refers to the dry papery cap.

In groups on leaves in woods, June to frost.

## LENTINUS

Suggesting both Pleurotus and Marasmius, but distinguished by being tough, and almost woody in age. It also resembles Pleurotus in being more or less excentric. It differs from both, as well as the nearly related Panus, by the toothed or notched edge of the gills, which is the distinguishing feature of the genus. The species grow on wood. When young, they are edible and more or less desirable. The name refers to the tough texture.

### Key to the Species

| | |
|---|---|
| 1. Stem present | |
| a. Cap hairy, reddish to tan | *L. lecomtei* |
| b. Cap scaly; white to tan | |
| (1) Cap whitish; gills decurrent | *L. tigrinus* |
| (2) Cap yellowish; gills sinuate-decurrent | *L. lepideus* |
| 2. Stem lateral or absent | *L. vulpinus* |

### Lentínus lecómtei Hairy Lentinus

Cap medium to large, 5-12 cm. wide, tan to reddish, hairy, depressed to funnel-form or irregular, with incurved margin; stem short, 2-4 cm., often excentric or lateral, tawny, hairy or smooth in age; gills decurrent, pale, narrow and crowded; spores ellipsoid, 5-6 × 2-3$\mu$.

Common on wood, throughout the growing season; tough but edible and well-flavored.

### Lentínus tigrínus Tiger Cap

Cap medium, 4-7 cm. wide, white or whitish, spotted more or less thickly with flat hairy blackish scales, plane to depressed and funnel-form; stem 4-5 cm., whitish, scaly, solid; gills decurrent, white or whitish, narrow and crowded; spores elliptic, 6-7 × 3-4$\mu$. The name refers to the blackish scales of the cap.

More or less common on old wood; edible but hardly desirable.

### Lentínus lepídeus Scaly Lentinus

Cap medium to large, 5-12 cm. wide, tan to yellow, with darker scaly spots, more or less depressed and irregular; stem 2-3 cm., whitish, scaly, solid, often irregular and excentric; gills decurrent, sinuate at the lower end, whitish, broad and crowded; spores elliptic, 7-11 × 3-5$\mu$. The name refers to the scaly cap.

Common on wood, especially on railway ties; edible, especially good when young.

FIGURE 27. LENTINUS LEPIDEUS

### Lentínus vulpínus Bracket Lentinus

Cap 2-14 cm. wide, tan to smoky, hairy and more or less warted, shelf-like, irregular, over-lapping; stem lacking or very short and lateral, the caps united at their bases; gills white, broad and crowded; spores subglobose, 2-3$\mu$; taste pungent. The name has no obvious reference.

On stumps and logs in the woods, summer and autumn; of no value.

### PANUS

Related to L e n t i n u s very closely, and to be separated from it only by the entire edge of the gills. It is doubtful that the two should be maintained as separate genera, but this is the usual practise. Certain species, though leathery, are edible; others are very astringent in taste, and correspondingly unpleasant, though not known to be poisonous. The ancient name of a fungus.

#### Key to the Species

1. Stem excentric; taste not astringent
   a. Cap and stem densely hairy — *P. strigosus*
   b. Cap not hairy but slightly scaly — *P. conchatus*
2. Stem entirely lateral; taste very biting — *P. stypticus*

#### Pánus strigósus Hairy Panus

C a p large, 10-25 cm. wide, white or whitish, covered with dense coarse hairs, more or less broadly and irregularly funnel-form; s t e m short and thick, 4-7 cm. by 2-3 cm., densely hairy, whitish; g i l l s decurrent, yellowish, broad and distant. The name refers to the hairy cap.

Often in dense clusters on trunks and stumps, in late summer and autumn; edible when young.

#### Pánus conchátus Shell Panus

C a p medium, 4-7 cm. wide, cinnamon, often paler, smooth or scaly, excentric and irregular to shelf-like; s t e m 2-3 cm. by 1 cm., pale, hairy at the base, solid; g i l l s decurrent into lines on the stem, whitish to yellow. The name refers to the shell-like form.

On trunks and stumps, in autumn; edible.

#### Pánus stýpticus Bitter Panus

C a p small, 2-4 cm. wide, cinnamon or paler, more or less roughened with bran-like scales, kidney-shaped or irregularly shelf-like; s t e m short, 2-3 cm. lateral, brownish or brown, solid; g i l l s not decurrent, cinnamon, connected by veins, narrow and crowded; s p o r e s globoid, 2-4 $\times$ 1-3$\mu$. The name refers to the astringent taste.

Common on stumps, more or less throughout the year; very unpleasant to the taste

### LENZITES

Characterized by being shelf- or bracket-like in form, the texture corky, and the gills more or less repeatedly branched. Its closest relative is D a e d a l e a among the pore-fungi; certain forms must be sought in both genera. None of the species are edible. Named for the botanist Lenz.

## Key to the Species

1. Gills whitish; cap slightly zoned, pale — *L. betulina*
2. Gills yellowish; cap markedly zoned, brown — *L. sepiaria*

### Lenzites betulina Pale Lenzites

Cap 3-10 cm. wide, whitish, corky, more or less densely hairy, slightly or not at all zoned, but with concentric grooves, bracket-like; stem lacking; gills

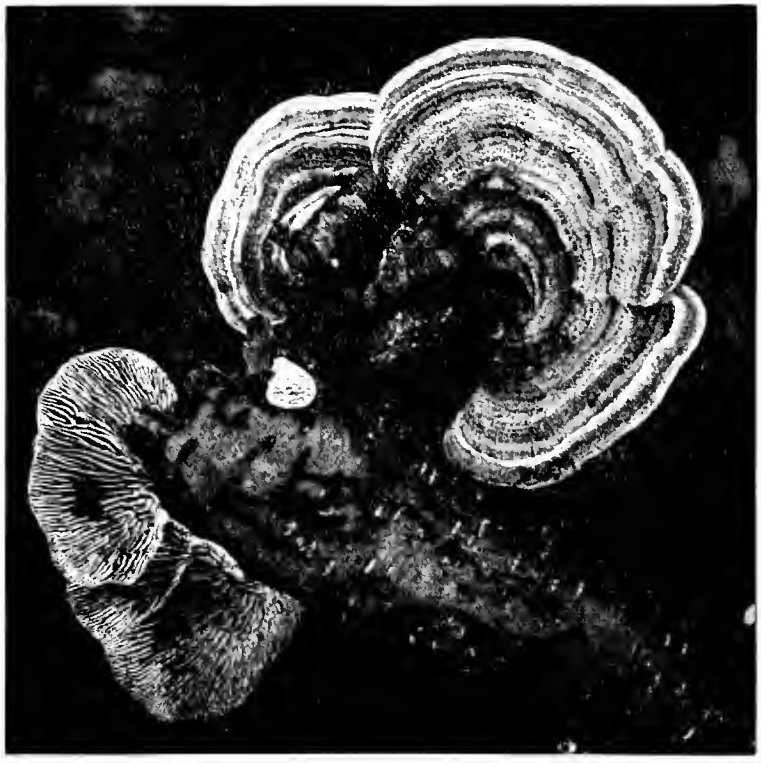

FIGURE 28. LENZITES BETULINA

whitish, more or less branched and united; spores elliptic, $4 \times 2\mu$. The name is of no definite application.

Common on trunks and stumps the year round.

### Lenzites sepiaria Brown Lenzites

Cap 5-8 cm. wide, brown, leathery, densely hairy and more or less roughened, with color zones of brown, bracket-like; stem none; gills yellowish, more or less branched and united; spores subglobose, $5 \times 4\mu$. The name refers to the sepia-brown color.

Common on trunks and stumps.

### SCHIZOPHYLLUM

Characterized by the two-forked edge of the gills, and the upturned woolly cap. Growing on wood; not poisonous, but too tough to be of value. The name refers to the forked gills.

### Schizophýllum commúne Fork Gill

Cap 1-4 cm. wide, white- or gray-woolly, upturned, attached excentrically, irregularly saucer-shaped; stem lacking; gills grayish to purplish; spores subglobose, 2-3$\mu$. The name refers to the frequence of the plant.

Everywhere on dead or dying twigs and trunks, in forest, orchard, etc.; not edible.

FIGURE 29. SCHIZOPHYLLUM COMMUNE

## Rose-spored Gill Fungi Rhodosporae

The spores seen in mass are rose-colored or more often salmon-pink, and usually give the same color to the gills.

### KEY TO THE GENERA


| | | Page |
|---|---|---|
| I. Stem central | | |
| 1. Stem readily separated from the cap | | |
| a. Stem with a cup or volva at base | **Volvaria** | 52 |
| b. Stem without a volva | **Pluteus** | 54 |
| 2. Stem and cap continuous, tearing when separated | | |
| a. Gills free, adnexed or sinuate | **Entoloma** | 55 |
| b. Gills decurrent | | |
| (1) Stem fleshy-fibrous | **Clitopilus** | 56 |
| (2) Stem cartilage-like | **Eccilia** | 58 |
| II. Stem lateral or lacking; on wood | **Claudopus** | 59 |

## VOLVARIA

Characterized among the pink-spored forms by the presence of a volva and the absence of a veil. It corresponds with Amanitopsis among the white-spored agarics. Many of the species grow upon wood, often on living trees, while others are found in very rich soil, and especially in greenhouses. The genus is generally suspected, but most of the species tried have proven edible. The name refers to the volva.

### Key to the Species

1. Cap soft or silky, not sticky
   a. Cap white — *V. bombycina*
   b. Cap dark, sooty or smoky — *V. volvacea*
2. Cap sticky, at least when moist
   a. Cap very small, 1-2 cm. wide — *V. parvula*
   b. Cap medium to large, 4-15 cm. wide
      (1) Cap very sticky, scarcely umbonate; large — *V. speciosa*
      (2) Cap sticky when moist, umbonate; medium — *V. umbonata*

### Volvária bombýcina Silky Volvaria

Cap large, 8-25 cm. wide, all white, and silky, more rarely somewhat scaly, hemispheric or bell-shaped to convex; stem 8-12 cm. by 1-2 cm. white, smooth, tapering upward, solid, volva large and spreading; gills free, salmon-pink, crowded; spores elliptic, 6-7 × 4μ. The name refers to the silky cap.

On the trunks of standing or fallen trees, from June to October; said to be edible.

FIGURE 30. VOLVARIA BOMBYCINA

### Volvária volvácea Dark Volvaria

Cap medium, 5-9 cm. wide, grayish or sooty, darkened with black fibrils, bell-shaped to convex; stem 8-14 cm. by 1 cm., white, smooth, solid, volva large,

spreading; gills free, pale pink; spores pink, elliptic, 6-8 × 4μ. The name refers to the large volva.

On the ground, often in cellars and greenhouses; said to be edible, but should be tried with caution.

### Volvária párvula Small Volvaria

Cap very small, less than 2 cm., white, sticky at first, dry when mature, smooth or fibrillose, umbonate, bell-shaped, convex or plane, sometimes grooved at the margin; stem short, 1-2 cm. by 2-3 mm., white, silky or smooth, somewhat hollow, volva often beautifully regular and split into four parts; gills free, pink, distant; spores pink, elliptic, 5-8 × 3-4μ. The name refers to the size.

On the ground in grass or weeds, and in greenhouses; edibility unknown.

FIGURE 31. VOLVARIA PARVULA

### Volvária speciósa Sticky Volvaria

Cap large, 8-14 cm. wide, white or whitish, often gray on the disk, very sticky, bell-shaped to expanded, margin not striate or furrowed; stem tall, 10-20 cm. by 2-3 cm., white, hairy, then smooth, solid, volva loose, hairy; gills free, pink to reddish; spores dark pink, globoid to ellipsoid, 12-18 × 8-10μ. The name refers to the handsome appearance.

Common in rich, especially in manured soil; said to be edible.

### Volvária umbonáta Disk Volvaria

Cap small or medium, 3-6 cm. wide, white to grayish, slightly sticky when moist, silky when dry, bell-shaped to flat, umbonate, striate or grooved at the margin; stem 5-7 cm., white or grayish, smooth, hollow, volva persistent but more or less torn; gills free, pink to reddish. The name refers to the presence of an umbo or disk.

In grassland from June to October; edibility unknown.

## PLUTEUS

Closely related to Volvaria, and distinguished from it only by the absence of the volva. In both, cap and stem separate readily and the gills are free. The last feature distinguishes Pluteus readily from Entoloma, which resembles it. Our species are all edible. They are found for the most part on stumps or decaying wood, or in soil rich in woody material. The name refers to the form of the cap.

### Key to the Species

1. Cap large, 5-16 cm. wide, not wrinkled or furrowed — *P. cervinus*
2. Cap small, 1-5 cm. wide, more or less wrinkled or furrowed
   a. Cap granular or hairy, not striate — *P. granularis*
   b. Cap not granular or hairy, striate — *P. admirabilis*

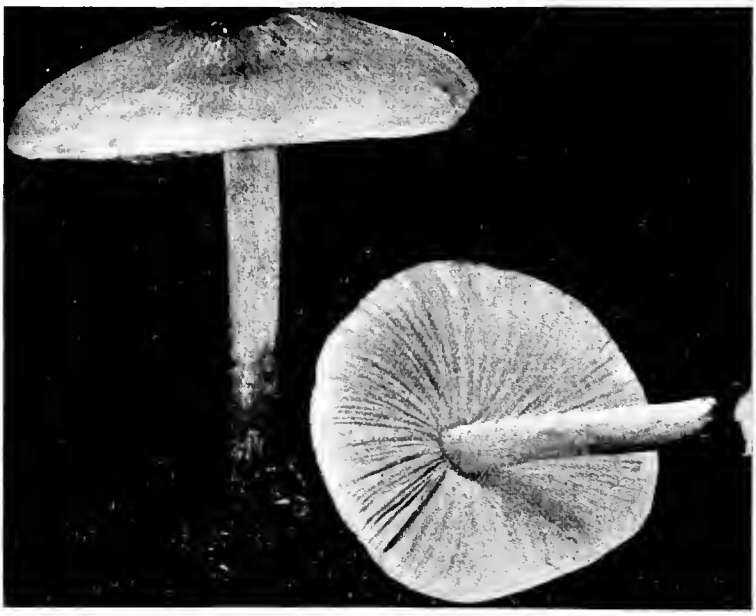

FIGURE 32. PLUTEUS CERVINUS

### Plúteus cervínus Fawn Pluteus

Cap large, 5-16 cm. wide, usually some shade of brown, from grayish or yellowish to blackish-brown, more or less fibrous or hairy on the disk, sometimes sticky, convex or plane; stem 7-15 cm. by ½-1 cm., brownish, smooth or black-hairy, solid; gills free, pink, broad; spores pink, rarely greenish, globoid, 7-8 × 5-6$\mu$. The name refers to the fawn-colored cap.

Common on stumps, logs, etc., from spring to autumn; delicious, though the stems must be cooked longer than the caps to make them tender.

### Plúteus granuláris Grainy Pluteus

Cap small, 2-5 cm. wide, yellowish, yellow or brown, more or less ridged and wrinkled and covered with granules, or granular-hairy, almost velvety, convex to plane; stem 2-7 cm. by 2-5 mm., yellowish to brown, hairy or velvety, solid; gills free, pink, broad and crowded; spores pink, globoid, 6-8 × 6$\mu$. The name refers to the granular cap.

On stumps and decaying wood, from spring to autumn; excellent.

### Plúteus admirábilis Fairy Pluteus

Cap very small, 1-2 cm. wide, yellowish to brown, more or less wrinkled or veined, moist or watery, smooth, striate at the margin, convex to plane, with a broad disk as a rule; stem slender, 2-5 cm. by 1-2 mm., whitish or yellowish, smooth, hollow; gills free, pink, broad and close; spores pink, subglobose, 6-8$\mu$. The name refers to the appearance of the plant.

On decaying wood in forest, summer and autumn; excellent.

## ENTOLOMA

Distinguished from Pluteus by having cap and stem continuous and the gills attached. It differs from Clitopilus in having the gills sinuate, never decurrent. Entoloma corresponds to Tricholoma among the white-spored forms, and to Hebeloma among the ocher-spored ones. All of our species are ground dwellers. Nearly all of them are reputed to be poisonous or are suspected, and the beginner will do well to leave them alone. The name has no clear application.

### Key to the Species

| | |
|---|---|
| 1. Plant without a strong odor; spores globose or angled | |
| a. Cap large; flesh biting | *E. grande* |
| b. Cap medium; flesh not biting | |
| (1) Cap gray with darker spots | *E. clypeatum* |
| (2) Cap brownish with reddish tinge | *E. rhodopolium* |
| 2. Plant with a strong unpleasant odor; spores elliptic | *E. gravcolens* |

### Entolóma gránde Large Entoloma

Cap large, 10-16 cm. wide, white, yellowish or brownish, smooth, convex to plane, more or less wrinkled about the broad umbo; stem 10-15 cm. by 2-3 cm., white, mealy above, solid; gills adnexed to nearly free, pink, broad; spores rosy, angular, globoid, 8-10$\mu$; odor and flavor farinaceous, but leaving a burning sensation in the mouth, according to McIlvaine. The name refers to the large size.

On the ground in woods, summer and autumn; suspected of being poisonous.

### Entolóma clypeátum Shield Entoloma

Cap 5-12 cm. wide, lurid gray when moist, gray and somewhat shining when dry, more or less watery and transparent, smooth, but mottled with darker spots, bell-shaped, then plane; stem 5-8 cm. by 1 cm., whitish or gray, fibrillose, mealy above, stuffed, then hollow; gills adnexed at first, then becoming free, dingy pink; spores rosy, angular-globose, 8-10$\mu$. The name refers to the shape of the cap.

On the ground in woods and grassland from spring to autumn; suspected.

### Entolóma rhodopólium Rosy Entoloma

Cap 5-12 cm. wide, brownish with a rosy or reddish tinge, watery, shining silky, convex to plane, somewhat umbonate; stem 4-10 cm. by 1 cm., white, mealy above, smooth below, hollow; gills adnate at first, then becoming free, rose, broad; spores rosy, six-angled, 8-10 $\times$ 6-8$\mu$. The name refers to the color of the cap and gills.

On the ground in woods, late summer and autumn; said to be edible.

### Entolóma gravéolens Fetid Entoloma

Cap 5-12 cm. wide, whitish to brownish, occasionally with a violet tinge, smooth, or slightly tufted on the margin, convex to nearly plane; stem 3-10 cm. by 1-3 cm., white, downy above, the bulbous base usually white-downy, solid; gills adnexed, grayish-white, then pinkish, narrow and crowded; spores pinkish, elliptic, 6-8 $\times$ 4-5$\mu$. The name refers to the strong odor. Resembles Tricholoma personatum closely; see figure 10.

On rich soil in woods, late summer and autumn; the unpleasant odor makes this plant undesirable.

## CLITOPILUS

Distinguished from Entoloma and Pluteus by the decurrent gills, and from Eccilia by the substance of the stem being fleshy or fibrous rather than cartilaginous. In some species the gills are scarcely decurrent, or merely adnate. Some of the species are delicious and none are known to be poisonous. Two of them occur in an abortive form which would be taken by many for a puff-ball, but they can usually be recognized by the presence of the normal form at some time during the season. The name refers to the sloping gills.

### Key to the Species

1. Plants clustered — *C. caespitosus*
2. Plants single or in groups, not clustered
   - a. Cap gray to brownish, minutely hairy, except when old — *C. abortivus*
   - b. Cap white or whitish, not hairy
     - (1) Cap sticky when moist — *C. orcella*
     - (2) Cap dry, not sticky — *C. prunulus*

### Clitopílus caespitósus Cluster Top

Cap medium, 5-10 cm. wide, white or whitish, shining, smooth, convex, then plane or slightly depressed; stem 4-8 cm. by 4-8 mm., white, mealy above, solid, more or less densely clustered; gills more or less decurrent, pinkish or brownish-pink, narrow and crowded; spores rosy, nearly globose, 5-4$\mu$. The name refers to the clustered habit.

In woodland and grassland, late summer and autumn; edible.

FIGURE 33. CLITOPILUS ABORTIVUS
(Abortive form)

### Clitopílus abortívus Dwarf Top

Cap medium, 5-10 cm. wide, gray or grayish-brown, minutely silky-hairy, not sticky, becoming smooth when old, convex, rarely plane; stem 3-7 cm. by 5-10 mm., grayish to gray-brown, striate, solid; gills more or less decurrent, rosy, narrow and close; spores rosy, irregular, ellipsoid, 8-11 $\times$ 5-6$\mu$. The name refers to the habit of producing deformed plants, which are usually more abundant than the normal ones, and are sometimes alone found. In this case, they are readily mistaken by the novice for puffballs, owing to their top-shaped or club-shaped form, and the absence of gills. Both forms are edible, but the abortive one is regarded as the better.

On ground and decaying wood in forest and woodland, late summer and autumn.

### Clitopílus orcélla Orcelle

Cap medium, 6-12 cm. wide, white or whitish, more or less sticky when wet, convex to plane or slightly depressed; stem 2-6 cm. by 7-10 mm., white, minutely scaly or powdery, solid; gills long decurrent, rosy, crowded; spores brownish-pink, ellipsoid, 8-10 $\times$ 5$\mu$. The name refers to the form of the cap.

On the ground in woodland, summer and autumn; delicious.

### Clitopílus prúnulus Plum Top

Cap medium, 5-12 cm. wide, white or somewhat grayish, more or less powdered, not sticky when wet, convex to plane, then depressed; stem 3-7 cm. by 6-14 mm., white, striate, solid; gills long decurrent, rosy; spores rosy or greenish, ovoid-elliptic, pointed at one end, 10-16 × 6$\mu$.

Common on ground in woods, from spring to frost; this species also occurs in the abortive form. Both forms are delicious.

## ECCILIA

This genus resembles Clitopilus closely, but is distinguished by the tough cartilage-like stem instead of a fibrous or fleshy one. The gills are decurrent, a

FIGURE 34. CLITOPILUS PRUNULUS

feature which separates it from the allied genera, Leptonia and Nolanea. The species are few and infrequent. The plants are small, and edible in our species. The name refers to the funnel-form cap.

### Eccília carneo-grísea Hollow Top

Cap small, 2-3 cm. wide, grayish pink, striate, more or less dotted with glistening points, especially at the margin, funnel-form; stem 3-5 cm. by 4-5 mm., grayish pink, smooth, hollow, more or less bent; gills decurrent, rosy, distant, darker on the edge; spores rosy, irregular, ellipsoid, roughened, 7 × 5$\mu$. The name refers to the color of cap and stem.

On the ground in woods, late summer to autumn; pleasant both raw and cooked.

CLAUDOPUS

Distinguished by the almost complete absence of the stem and the pink spores. The last feature separates it from Pleurotus. The species grow on wood, usually with the gills turned upward. For the most part, they are small and infrequent, and of little value. The name means "lame foot," referring to the short or absent stem.

### Key to the Species

1. Cap and gills yellow or yellowish — *C. nidulans*
2. Cap white; gills rosy or rust-colored — *C. variabilis*

### Claúdopus nídulans
### Nest Cap

Cap 2-8 cm. wide, inverted, stemless, often overlapping, back yellow or yellowish, finely hairy, especially toward the margin, more or less shell- or saucer-shaped and irregular; gills yellow, rather broad and close; spores rosy, ellipsoid, curved, 6-8 × 4-5$\mu$. The name refers to the form and position of the cap.

On wood in autumn; edible but hardly desirable.

FIGURE 35. CLAUDOPUS NIDULANS

### Claúdopus variábilis
### Lame Foot

Cap small, 1-3 cm. wide, stemless or with a very short stem, inverted, back white, hairy, more or less saucer-shaped and irregular; gills rosy or rust-colored, broad and distant; spores rosy; ellipsoid, 6-7 × 2-4$\mu$. The name refers to the varying form.

Common on wood and twigs in autumn; of no value.

## Ocher-spored Gill Fungi Ochrosporae

The spores range in color from pale or dark ocher to bright yellow, orange-yellow and rust-color, with the gills more or less of the same color.

KEY TO THE GENERA

I. Gills not separating readily from the cap
  1. Veil not forming a cobwebby curtain at edge of cap
    a. Stem central

| | | Page |
|---|---|---|
| (1) Stem with a ring | Pholiota | 60 |
| (2) Stem without a ring | | |
| (a) Gills persistent, not dissolving | | |
| x. Stem fleshy | | |
| (x) Gills usually sinuate | | |
| m. Cap silky or scaly | Inocybe | 63 |
| n. Cap smooth, more or less sticky | Hebeloma | 63 |
| (y) Gills adnate or decurrent | Flammula | 64 |
| y. Stem cartilage-like | | |
| (x) Cap turned in at margin when young | Naucoria | 65 |
| (y) Cap not turned in at margin when young | | |
| m. Stem and cap continuous; gills adnexed | Galera | 66 |
| n. Stem separating from cap; gills free | Pluteolus | 64 |
| (b) Gill dissolving into a watery liquid | Bolbitius | 68 |
| b. Stem excentric or none; on wood | Crepidotus | 71 |
| 2. Veil forming a cobwebby curtain at margin of cap, often disappearing completely when old | Cortinarius | 69 |
| II. Gills separating readily from the cap; margin always inrolled | Paxillus | 72 |

FIGURE 36. CLAUDOPUS VARIABILIS

## PHOLIOTA

Distinguished from the other ocher-spored genera by the presence of a ring, though the latter is sometimes small, or even inconspicuous in age. It is most closely related to Cortinarius in which, however, the gill veil persists as a curtain at the edge of the cap. Among the white-spored forms, it corresponds with Armillaria. Some of the most common species grow in dense clusters on stumps or the trunks of living trees. McIlvaine praises them highly, though they have usually been regarded as undesirable. The name refers to the scaly cap and stem of many species.

## Key to the Species

1. On the ground
   a. Cap bright yellow, wrinkled, with white tufts when young — *P. caperata*
   b. Cap whitish to brownish, smooth — *P. praecox*
2. On wood
   a. Cap very sticky when wet; gills adnate — *P. adiposa*
   b. Cap dry or somewhat sticky; gills sinuate or decurrent
      (1) Cap dry; gills decurrent by a tooth — *P. squarrosa*
      (2) Cap somewhat sticky; gills sinuate, nearly free — *P. subsquarrosa*

### Pholióta caperáta Yellow Pholiota

Cap large, 7-14 cm. wide, bright yellow, slightly sticky when wet, wrinkled at the margin and at first with a crust of white tufts, convex, then plane; stem stout, 10-15 cm. by 2-3 cm., white and shining, scaly above the thin broad ring, solid; gills adnate, buff-brown, narrow, crowded; spores rust-colored, globoid, 10-12 × 8-9$\mu$. The name refers to the wrinkled or furrowed cap.

In woods in autumn; edible, though when raw with a somewhat biting taste.

### Pholióta praécox Early Pholiota

Plate II: 1

Cap small, 2-5 cm. wide, whitish, tan or brownish, often darker toward the center, smooth, convex to plane; stem 4-8 cm. by 4-7 mm., whitish or yellowish, nearly smooth, stuffed or hollow, ring white; gills adnexed, brownish or rust-brown, crowded; spores rust-brown, ellipsoid, 8-12 × 6-7$\mu$. The name refers to its appearance in spring and summer.

In grassland, pastures, lawns, etc., April to midsummer.

### Pholióta adipósa Sticky Pholiota

Cap medium, 5-10 cm. wide, yellow, very sticky when moist, with spreading or erect rust-brown scales, which sometimes disappear when old, convex to plane; stem 5-15 cm. by 1-2 cm., yellow, paler above and darker, scaly below the more or less imperfect tufted ring, solid or stuffed; gills adnate, yellowish to rust-colored, broad, crowded; spores rust-colored, elliptic, 7-8 × 5$\mu$. The name may refer to the sticky cap.

In clusters on stumps or dead trunks in woodland, late summer to frost; edible, but the cap should be peeled.

### Pholióta squarrósa Shaggy Pholiota

Cap medium to large, 6-14 cm. wide, yellow to rust-color, dry, densely scaly with crowded, more or less spreading scales, bell-shaped to convex or plane; stem 8-20 cm. by 1-3 cm., yellow to rust-color, with crowded spreading darker scales below the ring, attenuate downwards, stuffed, ring tufted; gills adnate but decur-

rent by a tooth, rust-colored, narrow, crowded; spores yellow to rust-colored, ellipsoid, 7-8 × 4-5$\mu$. The name refers to the spreading scales.

In dense clusters on stumps or tree trunks, rarely on the ground near stumps, July to frost; the caps are good, both raw and cooked.

FIGURE 37. PHOLIOTA ADIPOSA

### Pholióta subsquarrósa Scaly Pholiota

Cap medium, 5-10 cm. wide, brownish rust-color, somewhat sticky, with close darker scales, bell-shaped to convex; stem 6-8 cm. by 8-10 mm., yellowish rust-color, with darker flattened scales below the zone-like ring, stuffed or hollow; gills

deeply sinuate, then almost free, yellow or dingy tan, crowded; spores rust-colored, elliptic, 6-8 × 4μ. The name refers to the relationship to the preceding.

In dense clusters on stumps or trunks, late summer to frost; said by McIlvaine to be unexcelled in croquettes and patties. The caps alone are used.

### INOCYBE

This genus is distinguished by a fibrous veil more or less continuous with the top of the cap, so that the latter has no distinct skin or pellicle, but is fibrous or scaly. In the closely related Hebeloma, the pellicle is distinct and often sticky. The two genera correspond to Tricholoma among the white-spored agarics. Some of the species are separated with difficulty from Cortinarius, but typically the curtain is absent. All the species are commonly regarded as not edible, though none are known to be seriously poisonous. The name refers to the silky or scaly cap.

## Inócybe geophýlla Silky Cone

PLATE II: 3

Cap small, 1-3 cm. wide and high, whitish or tan to brownish or pale lilac, the surface closely fibrillose silky and shining, often splitting in lines, especially near the margin, typically conical, but often with the margin expanded or upturned, umbonate; stem 5-6 cm. by 2-5 mm., white or whitish, powdered above, with more or less of a curtain, stuffed; gills adnexed, gray-brown, crowded; spores sooty brown, ovoid, 8 × 5μ. The name is perhaps in fanciful reference, i. e., "earth leaf," to the beauty of the plant.

Common on the ground in forests, especially of conifers, summer and autumn; it is not known to be of value.

### HEBELOMA

Distinguished from Inocybe by the smooth, often sticky pellicle of the cap. It represents Tricholoma among the ocher-spored forms. The species are commonly regarded as poisonous, but McIlvaine has found several of them edible. The name is not of obvious application.

### Key to the Species

1. Veil not visible — *H. crustuliniforme*
2. Veil present as a curtain or ring, at least when young
   a. Cap very sticky, slimy when wet; odor mild — *H. glutinosum*
   b. Cap somewhat sticky when wet; odor unpleasant — *H. fastibile*

## Hebelóma crustulinifórme Pie Cap

PLATE II: 2

Cap small to medium, 3-8 cm. wide, whitish to tan, darker on the disk, smooth, slightly sticky when young, convex to plane, with an umbo; stem 6-8 cm. by

5-6 mm., white or whitish, with white scales above, stuffed or hollow; gills adnexed, tan then brown, narrow and crowded; spores sooty-tan, ellipsoid, 10-12 × 5-7μ. The name refers to the shape of the cap.

Common in grassland, during late summer and autumn; the taste is bitter and the odor unpleasant. It is regarded as poisonous.

### Hebelóma glutinósum Sticky Hebeloma

Cap medium, 6-8 cm. wide, yellowish white, darker on the disk, covered with a tenacious glue, slimy when wet, dotted with white scales, convex to plane; stem 6-8 cm. by 1 cm., whitish, with white scales, mealy above, with more or less of a curtain when young, stuffed; gills adnexed, more or less sinuate, yellowish brown, broad, crowded; spores yellow, elliptic, 10-12 × 5-6μ. The name refers to the very sticky cap, which often exudes drops of glue in wet weather.

In woods, late summer and autumn; said by McIlvaine to be of good quality.

### Hebelóma fastíbile Fetid Hebeloma

Cap small to medium, 3-8 cm. wide, whitish to tan or brownish, smooth, more or less sticky, convex to upturned; stem 6-12 cm. by 1-3 cm., white or whitish, fibrous-silky or scaly, somewhat bulbous, solid, with a distinct white curtain, often in the form of a ring; gills sinuate, yellowish brown, rather broad and distant; spores yellow, ovoid, 10-12 × 6-8μ. The name refers to the unpleasant odor.

In woodland and grassland, summer and autumn; said to be dangerous.

## PLUTEOLUS

Distinguished among ocher-spored forms by the completely free gills. It is readily separated from Pluteus, which has pink spores. Our one species is rare. The name is a diminutive of Pluteus.

### Plutéolus reticulátus Net Cap

Cap small, 2-5 cm. wide, pale lilac, sticky, covered with net-like veins, striate at the margin, bell-shaped to convex, then plane; stem 2-5 cm. by 2-4 mm., whitish or white, mealy above, hollow, fragile; gills free, rust-colored, broad and crowded; spores rust-colored, elliptic, 10-13 × 5-6μ. The name refers to the veins on the cap.

Rare, on decaying wood in forests, late summer and autumn; said by McIlvaine to be tender and of fine flavor.

## FLAMMULA

Characterized by the fleshy-fibrous stem, much like the texture of the pileus, and by adnate or decurrent gills. It is distinguished with difficulty by the beginner from Inocybe. Hebeloma and Naucoria. Our species are readily dis-

tinguished however by their habit of growing on wood and by their bright yellow or orange color. Probably all the species are edible. The name refers to the bright color of the cap.

### Key to the Species

1. Gills rust-colored
   a. Cap light yellow — *F. flavida*
   b. Cap deep yellow to rust-color — *F. alnicola*
2. Gills cinnamon — *F. sapinea*

### Flámmula flávida Yellow Flame

Cap small to medium, 2-6 cm. wide, light yellow, smooth, convex to plane; stem 4-7 cm. by 3-6 mm., yellow or whitish, tending toward rust-color, smooth, hollow, sometimes curved; gills adnate, yellow to rust-colored, rather crowded; spores yellowish, globoid, 6-8·× 4-5$\mu$. The name refers to the light yellow color.

On decaying wood and trunks, summer and autumn; the taste is bitter, but disappears in cooking. The caps are tender and good.

### Flámmula alnícola Golden Flame

Cap medium, 6-9 cm. wide, bright yellow to rust-colored, rarely greenish, smooth, convex to plane; stem 6-8 cm. by 6-10 mm., yellow, tending to rust-color, smooth, often with traces of a ring, tapering downward, stuffed, then hollow; gills adnate or slightly decurrent, pale or yellowish, then rust-colored, broad; spores yellowish, ellipsoid, 8 × 5$\mu$. The name refers to the habit of growing on alder.

In groups and small clusters on fallen stem of alder and birch especially, July to December; taste bitter, but this disappears on cooking, according to McIlvaine.

### Flámmula sapínea Pine Flame

Cap 3-10 cm. wide, golden to golden brown, finely scaly, then cracked, convex to plane; stem 5-8 cm. by 5-10 mm., yellow, furrowed, rooting, stuffed or solid, more or less flattened and irregular; gills adnate, rarely decurrent, golden, then golden-brown or brown, broad; spores yellowish, ellipsoid, 8 × 5$\mu$. The name refers to its growth on pine wood.

Usually more or less clustered on wood, especially of conifers, summer and autumn; odor strong. Probably edible, but not tested.

## NAUCORIA

Characterized among ocher-spored forms by the cartilaginous stem, adnate or free gills, and the margin of the cap which is inturned at first. The last feature separates it from Galera to which it is most nearly related. Naucoria corre-

sponds to Collybia among the white-spored agarics. The plants are mostly small, and occur in grassland, though a few are found on well-decayed wood. All of our species are edible. The name refers to the shape of the cap.

### Key to the Species

1. Cap usually hemispheric, sticky when moist; stem rust-brown — *N. semiorbicularis*
2. Cap convex to plane, not sticky; stem yellowish or pale
   a. Cap brownish; gills rust-colored — *N. hamadryas*
   b. Cap yellowish; gills brown — *N. pediades*

### Naucória semiorbiculáris Nutshell Cap

Cap small, 2-6 cm. wide, tawny to rust-colored, paler in age, sticky when wet, smooth, often cracked in age, more or less persistently hemispheric, finally convex or plane; stem 7-12 cm. by 2-3 mm., rust-colored to reddish brown, smooth, tough, containing a free tube of fibers; gills adnate, rarely sinuate, rust-colored, very broad, crowded; spores rust-colored or brownish, elliptic, 10-12 × 5-8μ. The name refers to the hemispheric cap.

Common in lawns and grassland everywhere, spring to frost; the caps are excellent.

### Naucória hamádryas Dryad Cap

Cap small, 2-5 cm. wide, brownish rust-color or brown, paler in age, dry, smooth, convex to plane; stem 5-8 cm. by 4-6 mm., whitish or yellowish, smooth, hollow; gills adnexed or sometimes nearly free, rust-colored, broad, crowded; spores rust-colored, elliptic, 12-14 × 7μ. The name is fanciful.

On the ground from spring to autumn; edible.

### Naucória pediádes Plain Naucoria

Cap small, 2-5 cm. wide, yellow to tan or paler, smooth, dry, often cracked in age, convex to plane; stem 5-8 cm. by 2-4 mm., yellowish, finely silky or smooth, tough, stuffed; gills adnexed, dull brown, broad; spores rust-brown, elliptic, 10-12 × 4-5μ; cystidia 30-40 × 8-10μ. The name probably refers to its growth in grassland.

On the ground in grassland from spring to frost; edible.

## GALERA

Related to Naucoria and Tubaria, but distinguished from the former by having the margin straight from the first, and from the latter by the adnate gills. It is characterized also by the more or less persistently conical or bell-shaped

cap, which is thin and often striate or furrowed. It corresponds with Mycena among the white-spored forms. The species are small, but so far as tested they are all edible. The flame refers to the hat- or cowl-like form.

### Key to the Species

1. Cap narrowly conical, pale yellowish — *G. lateritia*
2. Cap conical to bell-shaped
   a. Cap scarcely striate, tan to rust-color or brown — *G. tenera*
   b. Cap distinctly striate-furrowed, yellow — *G. flava*

FIGURE 38. NAUCORIA PEDIADES

### Galéra laterítia Cone Galera

Cap 2-3 cm. wide, yellowish to tan or darker, thin, smooth, slightly striate when moist, narrowly and persistently conical, or finally somewhat bell-shaped; stem 8-10 cm. by 2-3 mm., whitish, white-powdered, hollow; gills adnexed or seemingly free, brown, very narrowly linear, crowded; spores brownish, rust-colored, elliptic, 12-14 × 8-10$\mu$. The name refers to the color.

On dung and among grasses, spring to frost; well-flavored and delicate.

### Galéra ténera Brownie Cap

PLATE II: 4

Cap small, 1-3 cm. wide, tan to rust-color or brown, rarely greenish or blackish, thin, smooth or slightly powdered, slightly striate when moist, conical to bell-shaped; stem 7-12 cm. by 2-3 mm., colored like the cap or paler, smooth, somewhat striate, hollow; gills adnate or seemingly free, brown, narrow, crowded; spores rust-brown, elliptic, 11-15 × 6-10$\mu$. The name refers to the thin texture of the cap.

Common on dung and in grassland from spring to autumn; excellent.

### Galéra fláva Yellow Galera

Cap small, 1-3 cm. wide, yellow, smooth, distinctly striate and furrowed at the margin and toward the disk, ovoid to bell-shaped; stem 5-8 cm. by 2-3 mm., whitish or yellowish, mealy or powdered, hollow; gills adnate, tan-brown, narrow and crowded; spores rust-brown, ovoid, 12-14 × 8$\mu$. The name refers to the color.

On ground in woods, especially where there is much leaf- or wood-mold; edible.

## BOLBITIUS

Resembling Galera, but distinct from all other genera of ocher-spored forms in the deliquescent or dissolving gills. It is like Coprinus among black-spored agarics in this respect. The forms are small, growing on dung or rich soil, and are edible. The name refers to the habitat.

### Key to the Species

1. Cap 4-6 cm. wide, furrowed at the margin — *B. boltoni*
2. Cap 1-2 cm. wide, merely striate at the margin — *B. fragilis*

### Bolbítius bóltoni Yellow Bolbitius

Cap 4-6 cm. wide, yellow or paler, smooth, thin, sticky, furrowed at the margin, more or less umbonate, conical then convex or expanded; stem 6-8 cm. by 6-8 mm., yellow or yellowish, floccose at first, hollow; gills adnexed, dingy yellow to brown; spores brown, ellipsoid, 14 × 8$\mu$. Named for the botanist, Bolton.

In manured ground or leaf-mold, summer and autumn; well-flavored.

### Bolbítius frágilis Fragile Bolbitius

Cap small, 1-2 cm. wide, light yellow or paler, smooth, thin, sticky, striate at the margin, conical to plane, more or less umbonate; stem 6-8 cm. by 2-4 mm.,

yellow or yellowish, smooth, hollow; gills adnexed or nearly free, brownish or brown; spores rust-colored, ellipsoid, 14-15 × 8-9μ. The name refers to the fragile cap and stem.

On dung, from May to frost; of good flavor.

### CORTINARIUS

Distinguished among ocher-spored genera by the presence of a cobwebby gill-veil which forms a curtain from the stem to the margin of the cap, and hangs from the latter for some time after expansion. This shows best in the young plants, often disappearing completely in age. Some species of Pholiota, Inocybe and Hebeloma possess a curtain, but it is less typical and persistent. In Cortinarius, moreover, the fibers of the veil are more clearly superficial, and the gills very powdery. The genus is enormous, and the species are closely related and difficult to determine. None of the species are known to be poisonous, but few are of real value as food. The name refers to the curtain-like veil.

#### Key to the Species

| | |
|---|---|
| 1. Cap sticky; gills purple when bruised | *C. purpurascens* |
| 2. Cap not sticky; gills not purple when bruised | |
| a. Cap and stem more or less violet in color | |
| (1) Whole plant violet | *C. violaceus* |
| (2) Plant whitish, tinged or marked with violet | *C. alboviolaceus* |
| b. Cap and stem not violet; buff, yellow or brown | |
| (1) Stem not bulbous, equal | *C. cinnamomeus* |
| (2) Stem usually bulbous, tapering upward | |
| (a) Cap brown; stem with a large tapering bulb | *C. squamulosus* |
| (b) Cap rust-yellow; stem with a small roundish bulb | *C. autumnalis* |
| (c) Cap cream to buff; stem somewhat bulbous | *C. ochroleucus* |

#### Cortinárius purpurascens Purple Gill

Cap large, 10-14 cm. wide, reddish-brown to tawny, smooth, very sticky when wet, convex to plane; stem stout, 6-8 cm. by 2-3 cm., pale blue, turning purple when touched, fibrillose, bulbous, solid; gills sinuate, bluish, then brown, purple when bruised, broad and crowded; spores rust-brown, elliptic, 8-10 × 5-6μ. The name refers to the purple gills.

On the ground in woods, late summer to autumn; one of the best species of this genus.

#### Cortinárius violáceus Violet Cortinarius

Cap 8-16 cm. wide, dull to deep violet, dry, with many hairy tufts or scales, convex to plane; stem 10-12 cm. by 1-2 cm., violet, fibrillose, bulbous, solid;

gills rounded or sinuate, violet at first, then brown, broad, distant; spores yellow-brown, ellipsoid, 12-14 × 7-9μ. The name refers to the color.

On the ground in woods, summer and autumn; one of the best edible species.

### Cortinárius albovioláceus Tinted Cortinarius

Cap 5-8 cm. wide, whitish, more or less tinted with violet, dry, smooth or silky, convex to plane; stem 5-10 cm. by 6-12 mm., whitish, marked with violet, especially at the top, hairy below the attachment of the curtain, bulbous, solid; gills adnexed, whitish-violet, then brown, usually finely toothed at the edge; spores dull yellow, ellipsoid, 6-9 × 4-5μ. The name refers to the color.

On the ground in woods, late summer to autumn; of fair quality.

### Cortinárius cinnamómeus Cinnamon Cortinarius

Cap 2-6 cm. wide, bright brown to deep brown, roughened with close scales or fibers, more or less smooth when old, convex to plane, more or less umbonate; stem 4-8 cm. by 4-7 mm., yellow to brown, mostly smooth, hollow; gills adnate, yellow, broad and crowded; spores dull yellow, elliptic, 7-8 × 3-4μ. The name refers to the color.

Common on ground in woods or clearings, late summer and autumn; edible.

FIGURE 39. CORTINARIUS CINNAMOMEUS

### Cortinárius squamulósus Scaly Cortinarius

Cap 5-10 cm. wide, brown, roughened with crowded darker scales, convex to plane; stem 7-14 cm. by 1-2 cm. above, 2-4 cm. at the bulb, brown, more or less scaly, solid; gills sinuate, brown; flesh pinkish-white. The name refers to the scaly cap.

On the ground in woods, late summer and autumn; caps fair.

### Cortinárius autumnális Rusty Cortinarius

Cap 5-10 cm. wide, dull rust-yellow, streaked with rusty fibers, convex to plane; stem 7-10 cm. by 1 cm., paler than the cap, smooth or scaly, bulbous, solid; gills sinuate, yellow-brown; flesh white. The name refers to its appearance in autumn.

On the ground in woods, autumn; fair.

### Cortinárius ochroleúcus Tan Cortinarius

Cap 2-7 cm. wide, cream-colored to dark tan, dry, hairy or finely scaly, often smooth in age, convex to plane; stem 6-8 cm. by 1 cm., tan, smooth, bulbous, tapering upward, solid or hollow; gills sinuate, ocher; spores yellow, elliptic, 8 × 4-5$\mu$. The name refers to the color.

On the ground in woods, late summer and autumn; probably edible.

## CREPIDOTUS

Distinguished among ocher-spored forms by the lateral or absent stem. It corresponds with Pleurotus and Claudopus. The species grow on wood, and so far as known are edible. The name means slipper-like.

FIGURE 40. CORTINARIUS OCHROLEUCUS

### Key to the Species

| | | |
|---|---|---|
| 1. | Cap inverted, pure white, silky | *C. versutus* |
| 2. | Cap usually shelf-like, grayish, smooth | *C. mollis* |

### Crepidótus versútus White Crepidotus

Cap 9-20 mm. wide, inverted, more rarely shelf-like, pure white on the back, densely and finely silky, kidney-shaped or rounded; gills rounded at the back, rust-colored, rather distant; spores rust-colored, ellipsoid, 8-10 × 4-6$\mu$. The name refers to the inverted cap.

Rather common on rotting logs and twigs, summer and autumn; probably edible, but not tested by the writer.

### Crepidótus móllis Gray Crepidotus

Cap 2-8 cm. wide, usually shelving, but sometimes with a short, lateral hairy stem, pale or grayish, smooth, more or less ovoid or kidney-shaped, often lobed; gills decurrent, brown, narrow and crowded; spores dark-brown, ellipsoid, 8-9 × 5-6$\mu$. The name refers to the soft texture.

On decaying wood, summer and autumn; probably edible, but not tested.

## PAXILLUS

Distinguished among ocher-spored forms by the readiness with which the gills are separated from the cap. The gills are decurrent and often fork and unite, so that they are more or less pore-like. Related to Gomphidius among the black-spored forms. Our species grow on the ground and are edible. The name has no evident application.

FIGURE 41. PAXILLUS INVOLUTUS

### Paxíllus involútus Roll Cap

Cap 7-14 cm. wide, yellowish, tawny or rust-colored, smooth, sticky when moist, convex to plane, finally depressed, the margin downy and inrolled, more or less striate and furrowed when unrolled; stem 5-8 cm. by 1-3 cm., pale yellow or rust-colored, smooth, solid, sometimes slightly excentric; gills decurrent, forking and uniting near the stem, forming pores, yellowish to rust-colored, broad and crowded; spores yellow, ellipsoid, 8-12 × 5-6$\mu$. The name refers to the inrolled margin.

Common on the ground in woods, late summer and autumn; edible.

## Purple-spored Gill Fungi Porphyrosporae

The spores show some tinge of purple; in mass they are usually purple-brown, and under the microscope more or less deep purple.

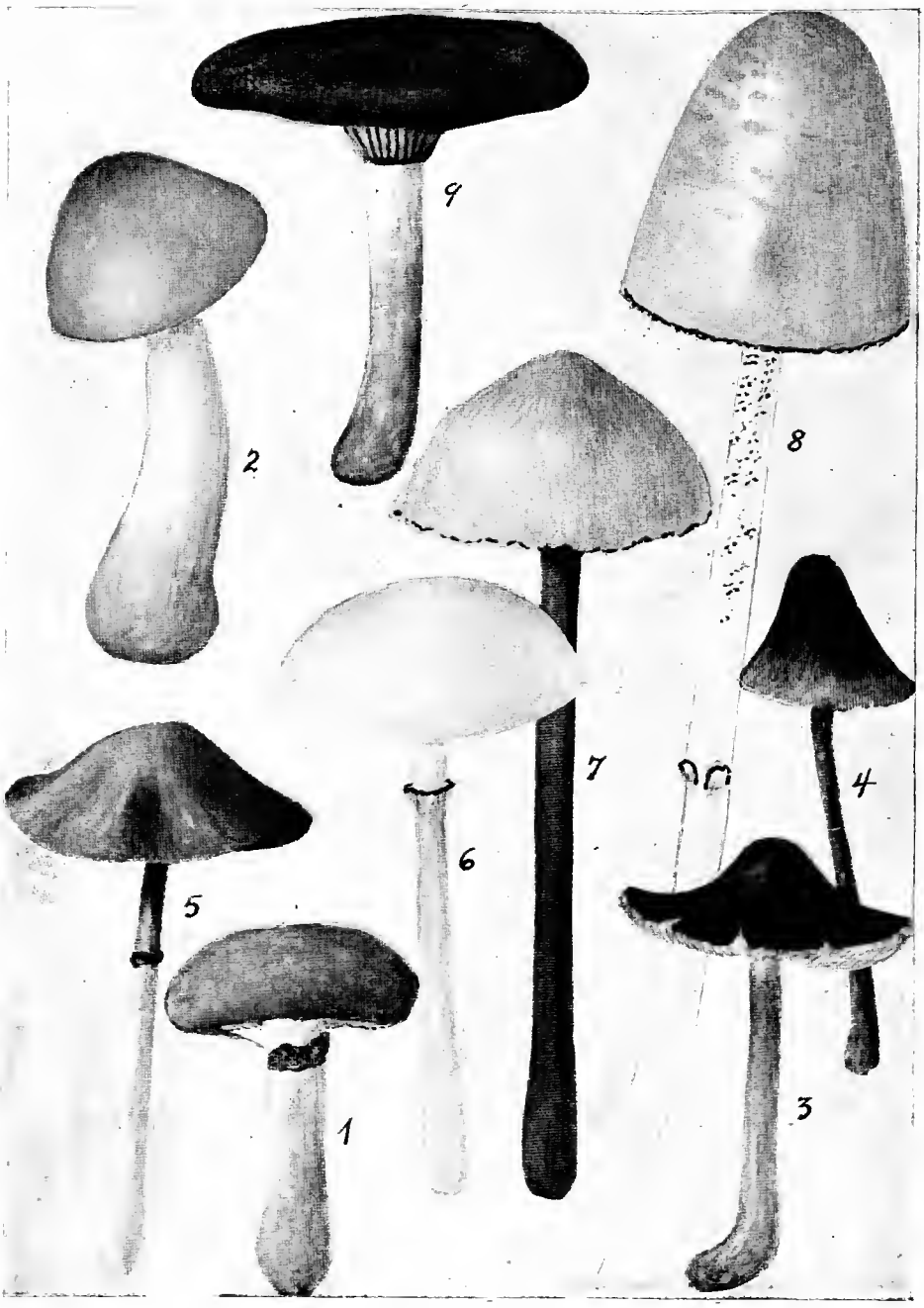


PLATE II.

1 1. Pholiota praecox
2. Hebeloma crustuliniforme
3. Inocybe geophylla
4. Galera tenera
5. Hypholoma candolleanum
6. Stropharia semiglobata
7 7. Panaeolus retirugis
8. Anellaria separata
9. Gomphidius viscidus

KEY TO THE GENERA

| | | Page |
|---|---|---|
| I. Stem separating readily from the cap, with a ring | **Agaricus** | 72 |
| II. Stem and cap continuous | | |
| 1. Stem usually with a distinct ring | **Stropharia** | 74 |
| 2. Stem without a distinct ring, margin often curtained by fragments of the veil | **Hypholoma** | 76 |

AGARICUS

Distinguished among purple-spored forms by the ring and the discrete stem. It differs from Stropharia chiefly in the last respect. It corresponds with Lepiota among the white-spored forms. The plants are for the most part large and fleshy, and of the highest repute for food. The name is the classical name for the common mushroom.

### Key to the Species

| | |
|---|---|
| 1. Flesh blood red when wounded | *A. haemorrhoidarius* |
| 2. Flesh not blood red when wounded | |
| a. Ring thick, narrow and double | *A. rodmani* |
| b. Ring broader, typically single | |
| (1) Cap densely covered with tiny brown scales | *A. placomyces* |
| (2) Cap usually smooth, or somewhat silky, rarely scaly | *A. campester* |

### Agáricus haemorrhoidárius Blood Mushroom

Cap 10-12 cm. wide, dull red or reddish brown, with broad flat scales, margin turned in at first, convex to plane; stem 8-12 cm. by 2-3 cm., white, blood red where bruised, fibrous, hollow, ring large, superior; gills free, rosy, then purple-brown, crowded; spores purple-brown, elliptic, 6-8 $\times$ 4-5$\mu$; the flesh everywhere turns red when touched, as the name indicates.

On the ground in woods, late summer and autumn; excellent.

### Agáricus ródmani Double Ring Mushroom

Cap 5-10 cm. wide, white or whitish, more or less yellowish toward the center, smooth or with a few scales, convex to plane; stem 5-8 cm. by 1-2 cm., whitish, smooth below the ring, scaly or mealy above, solid, ring thick, narrow and double, appearing to be two; gills free or just touching the stem, pink, then dark purple-brown, narrow and crowded; spores globoid, purplish, 5-6 $\times$ 4-5$\mu$. Named after the mycophagist, Rodman.

On the ground, summer and autumn; excellent.

### Agáricus placómyces Scaly Agaricus

Cap 5-10 cm. wide, whitish, but often so densely covered with tiny brown scales as to be almost wholly dull brown, the margin white at maturity but the disk nearly always brown, convex to flat; stem 7-14 cm. by 8-14 mm., white or whitish, smooth, stuffed or hollow, bulbous, with a large superior ring; gills free, pink, then dark purple-brown, crowded; spores purple-brown, ellipsoid, 4-6 × 3-4$\mu$. The name refers to the flattened cap.

Common in grassland or woodland, summer and autumn; excellent.

### Agáricus campéster Common or Cultivated Mushroom

Cap 5-15 cm. wide, white, whitish, grayish to reddish or brownish in some forms, smooth, or in some forms silky, hairy or scaly, convex to plane; stem 4-10 cm. by 1-2 cm., whitish, more or less smooth, stuffed, ring near the middle, more or less torn; gills free, pink, then dark brown, broad, crowded; spores purple-brown, ellipsoid, 7-9 × 6$\mu$. The name refers to its habit of growing in meadows and pastures.

FIGURE 42. AGARICUS PLACOMYCES

Common in grassland from spring to winter; the standard edible mushroom, and the only one commonly cultivated. It is extremely variable, but it is impossible for the beginner to distinguished its many forms or some of the closely related species.

#### STROPHARIA

Distinguished by the presence of a ring, and the continuity of the stem and cap. The ring is sometimes small, or absent in age. The gills are usually adnate. Our species are all sticky, and with one exception are found on dung or in well-manured soil. They are probably all edible, but the first should be tried very cautiously. The name refers to the ring.

### Key to the Species

1. Cap blue-green with a sticky slime; on the ground — *S. aeruginosa*
2. Cap yellowish or yellow; on dung or well-manured soil
   a. Stem stuffed; gills of one color; cap convex, then plane — *S. stercoraria*
   b. Stem hollow; gills black spotted or clouded; cap hemispheric — *S. semiglobata*

FIGURE 43. AGARICUS CAMPESTER

### Strophária aeruginósa Green Stropharia

Cap 7-11 cm. wide, bluegreen with a sticky slime, yellowish as the latter disappears, convex to plane, more or less umbonate; stem 5-8 cm. by 6-12 mm., bluegreen, sticky, hollow, ring more or less torn, superior; gills adnate, dark purple; spores purplish brown, elliptic, 8-10 × 4-5$\mu$. The name refers to the green slimy covering.

On the ground in grassland, summer and autumn; suspected of being poisonous, but this is not proved.

FIGUE 44. HYPHOLOMA PERPLEXUM

### Strophária stercorária Yellow Stropharia

Cap 1-3 cm. wide, yellow or yellowish, smooth, sticky, sometimes slightly striate at the margin, convex to plane; stem 7-12 cm. by 4-6 mm., yellow or yellowish, sticky, stuffed with a distinct pith, ring narrow, remote from cap, sticky; gills adnate, dull brown, not clouded or mottled, broad; spores dark, ellipsoid, 18-20 × 10-12$\mu$. The name refers to its habit of growth.

Common on dung or in well-manured ground, spring to autumn; the caps are excellent.

### Strophária semiglobáta Hemispheric Stropharia

PLATE II: 6

Cap 1-3 cm. wide, yellow or yellowish, smooth, sticky, hemispheric; stem 6-8 cm. by 2-3 mm., yellowish, smooth, sticky, hollow, with an incomplete sticky ring; gills adnate, mottled or clouded with black, broad; spores dull purple or blackish purple, ellipsoid, 13-14 × 8-9$\mu$. The name refers to the hemispheric cap.

Common on dung and in well-manured soil, spring to winter; the caps are good.

## HYPHOLOMA

Distinguished by the breaking up of the gill veil into a fragmentary curtain, which is more or less persistent on the margin of the cap. An incomplete ring is sometimes formed. The gills are usually attached. The name refers to the curtain.

## Key to the Species

1. Cap opaque, thickish, more or less reddish yellow
   a. Taste bitter; gills purplish brown — *H. perplexum*
   b. Taste mild; gills soot-colored or sooty-olive — *H. sublateritium*
2. Cap thin, translucent when moist, whitish to brownish
   a. Gills dark violet at first — *H. candolleanum*
   b. Gills whitish or pinkish at first
      (1) Cap white — *H. incertum*
      (2) Cap brownish to yellowish — *H. appendiculatum*

### Hypholóma perpléxum Bitter Hypholoma

Cap 5-8 cm. wide, reddish or reddish brown, yellowish toward the edge, smooth, convex to plane; stem 5-8 cm. by 5-8 mm., reddish brown, yellowish above, nearly smooth, hollow; gills rounded at back and readily separating from the stem, yellowish then greenish and finally purple-brown; spores purple-brown, elliptic, 6-7 × 3-4$\mu$. The name refers to its close resemblance to the next and to other related forms.

Usually in dense clusters on or about trunks and stumps, late summer and autumn; edible, good also dried and pickled.

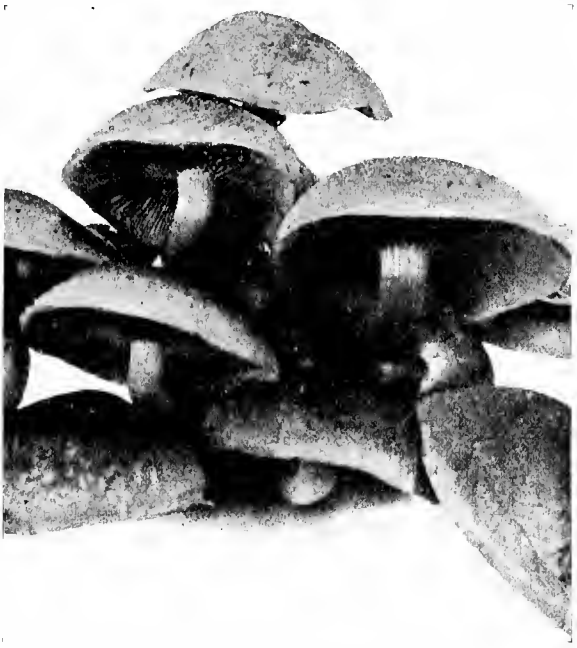

FIGURE 45. HYPHOLOMA SUBLATERITIUM

### Hypholóma sublaterítium Brickred Hypholoma

Cap 5-10 cm. wide, brickred, yellowish toward the margin, at first silky, then smooth, convex to plane; stem 6-10 cm. by 4-7 mm., rust-colored, scaly or silky, stuffed; gills adnate, dull yellowish, then soot-colored with an olive tinge, crowded; spores brown purple, ellipsoid, 6-7 × 3-4$\mu$. The name refers to the color of the cap.

More or less clustered on trunks and stumps, autumn; edible.

### Hypholóma candolleánum Violet Hypholoma

PLATE II: 5

Cap 5-11 cm. wide, brown to whitish or somewhat yellowish, smooth, bell-shaped to convex or expanded, margin with cobwebby fragments of the veil; stem 6-8 cm. by 4-8 mm., white, striate above, hollow, sometimes with a faint ring; gills adnexed, then free, beautiful violet at first, the edge whitish, then brown, crowded; spores brownish, elliptic, 8 × 4μ. The name refers to the botanist De Candolle.

Clustered on the ground or on wood in the soil, summer and autumn; excellent.

FIGURE 46. HYPHOLOMA APPENDICULATUM

### Hypholóma incértum White Hypholoma

Cap 2-5 cm. wide, white or whitish, yellowish on the disk, smooth, more or less furrowed, bell-shaped to convex or plane, the margin adorned with fragments of the veil when young; stem 4-8 cm. by 2-5 mm., white, mealy above, hollow; gills adnexed, whitish, finally pink-brown, narrow, crowded; spores purple-brown, elliptic, 8 × 5μ. The name refers to its similarity to the preceding and the following.

In groups or clusters on the ground, in woodland or in openings, spring to autumn; excellent.

### Hypholóma appendiculátum Brown Hypholoma

Cap 4-7 cm. wide, brown, brownish or yellowish, smooth, bell-shaped to convex or plane, the margin with fragments of the veil; stem 6-8 cm. by 4-7 mm.,

white, mealy above, hollow; gills adnate or adnexed, white, then pink, and finally dull brown; spores darkish, ellipsoid, 6-8 × 3-4μ. The name refers to the incomplete curtain at the margin.

Densely clustered on trunks or stumps, summer and autumn; excellent.

## Black-spored Gill Fungi Melanosporae

Spores black or blackish, not purple or brown.

### KEY TO THE GENERA

| | | Page |
|---|---|---|
| 1. Gills dissolving into a black ink | **Coprinus** | 79 |
| 2. Gills not dissolving | **Anellaria** | 84 |
| a. Stem with a ring | | |
| b. Stem without a ring | | |
| (1) Gills not decurrent | | |
| (a) Cap fleshy, smooth, not furrowed | **Panaeolus** | 82 |
| (b) Cap membranous, furrowed | **Psathyrella** | 84 |
| (2) Gills long decurrent | **Gomphidius** | 85 |

### COPRINUS

Distinguished from all gill fungi by its black spores and dissolving gills. It is related to Bolbitius, which has ocher spores. This genus contains several of the best of all edible fungi, and is fortunately readily recognized even by the novice. On the second or third day, the caps expand more or less completely, and the gills begin to dissolve, forming a black inky liquid. As this dries, the gills become mere lines. The blackening of the gills begins early, but the caps are good until the gills begin to dissolve. The name refers to the habit of growing on dung or in richly manured ground.

### Key to the Species

| | |
|---|---|
| 1. Cap shaggy with scales, oblong or cylindric; ring usually present | *C. comatus* |
| 2. Cap smooth or scaly, not shaggy, ovoid or bell-shaped; ring usually lacking | |
| a. Cap with tufted white scales when young; on dung | *C. fimetarius* |
| b. Cap smooth or somewhat scaly or mealy | |
| (1) Cap thick, even, grayish or lead-colored | *C. atramentarius* |
| (2) Cap thin, striate, yellowish or brownish | *C. micaceus* |

## Coprínus comátus Shaggy Mane

Cap 5-20 cm. tall, 3-8 cm. wide, white, whitish or yellowish, darker on the disk, shaggy with coarse, more or less concentric scales, cylindric or oblong at first, then more or less bell-shaped, splitting at the margin; stem 10-24 cm. by 1-2 cm., white or whitish, smooth, readily separating from the cap, hollow, but somewhat cobwebby within, ring large and movable or incomplete; gills free, white, turning to pinkish, purple, black, and finally dissolving into a black ink, broad and

FIGURE 47. COPRINUS COMATUS
(Form when fresh)

FIGURE 48. COPRINUS COMATUS
(Form after the gills have dissolved)

densely crowded; spores black, elliptic, 16-18 × 10$\mu$. The name refers to the shaggy cap.

Common in lawns and grassland, in groups or clusters, from earliest spring to severe frost; it reappears year after year in the same spot. One of the very best of the mushrooms.

## Coprínus fimetárius Mealy Inkcap

Cap 2-6 cm. wide, bluish black or blackish, densely covered with white tufted scales which disappear as the cap expands, finally smooth, splitting at the margin, cylindric or conic, then more or less expanded at the margin; stem 5-8 cm. by 5-8

mm., white, somewhat downy, hollow, but solid and bulbous at the base; gills free, black, narrow, crowded; spores black, ellipsoid, 12-15 × 8-10μ. The name refers to its habitat.

Common on dung and on manure heaps, from spring to winter; excellent.

### Coprínus atramentárius Inky Cap

Cap 4-10 cm. tall, 4-8 cm. wide, grayish or gray-brown, usually smooth, but sometimes scaly, especially toward the disk, margin even, more rarely ribbed, ovate or irregularly bell-shaped, then expanded; stem 8-12 cm. by about 1 cm., white or whitish, smooth, hollow, with a more or less imperfect ring below; gills free, black, broad, crowded; spores black, ellipsoid, 8-10 × 6μ. The name refers to the inky liquid formed by the gills.

FIGURE 49. COPRINUS ATRAMENTARIUS

Common in dense clusters in lawns, gardens, waste places, etc., earliest spring to frost; the best of all edible species in the opinion of the writer. It is especially good raw, particularly in salads.

### Coprínus micáceus Mica Inkcap

Cap 2-5 cm. wide, whitish-yellow, yellowish or brownish, more or less sprinkled with bright mica-like particles, striate, splitting and turned up at the margin, ovoid or bell-shaped, then expanded; stem 6-10 cm. by 5-6 mm., white, somewhat powdered or silky, hollow; gills adnexed, white, pink, then black, narrow, crowded; spores black or brown-black, elliptic, 7-8 × 5-6μ. The name refers to the mica-like particles on the cap.

Common in dense clusters about stumps and trunks, earliest spring to frost; excellent.

## PANAEOLUS

In habitat, Panaeolus suggests Coprinus, but it is readily distinguished by the persistent gills. It is most readily separated from Psathyrella by the absence of furrows or striations on the margin, and from Stropharia, with which it is often associated, by the black spores and the absence of a ring. The species are very common on dung or in rich soil. Several of the species are edible, but one or two still remain suspected. The name means variegated, and refers to the mottled gills.

FIGURE 50. COPRINUS MICACEUS

### Key to the Species

1. Parasitic on other mushrooms — *P. epimyces*
2. Not parasitic
   a. Stem solid — *P. solidipes*
   b. Stem hollow
      (1) Cap with net-like markings, margined by the veil — *P. retirugis*
      (2) Cap smooth, veil fragments lacking

(a) Cap bell-shaped, brownish; stem reddish; gills medium — *P. campanulatus*

(b) Cap hemispheric, whitish; stem whitish; gills very broad — *P. papilionaceus*

### Panaéolus epímyces Parasitic Panaeolus

Cap 2-3 cm. wide, white, silky, globose, then convex or plane; stem 2-4 cm. by 7-10 mm., whitish, striate, mealy, finally hollow; gills adnexed, whitish, then brownish or blackish, broad, crowded; spores black, elliptic, 7-9 × 5-6μ. The name refers to the habit of growing on other fungi.

Occasional, parasitic on other mushrooms, which it distorts; summer and autumn.

### Panaéolus solídipes Nailstem Panaeolus

Cap 5-8 cm. wide, whitish or slightly yellowish, smooth, or finally with broad yellowish scales, hemispheric to bell-shaped and convex; stem 10-20 cm. by 4-6 mm., white, slightly striate above, smooth below, solid; gills somewhat adnexed, black, broad. The name refers to the solid stem.

On dung or in very rich soil, spring to autumn; edible.

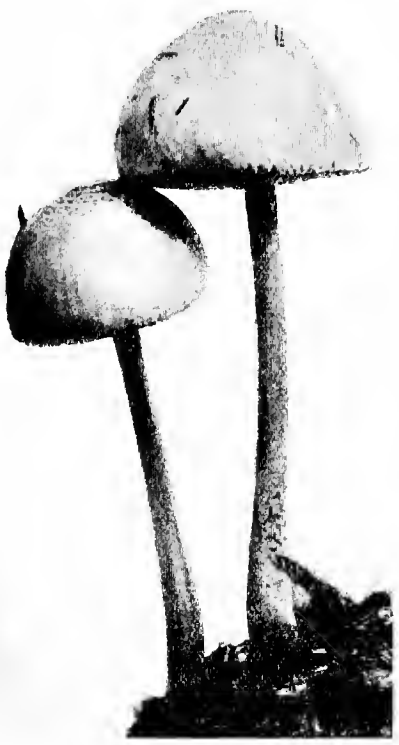

FIGURE 51. PANAEOLUS SOLIDIPES

### Panaéolus retirúgis Netcap Panaeolus

PLATE II: 7

Cap 1-4 cm. wide, grayish, tan or brownish, often darker on the disk, the latter more or less wrinkled and netted, usually cracking when mature, hemispheric to bell-shaped, margin beautifully curtained by triangular fragments of the veil; stem 5-15 cm. by 4-5 mm., whitish, grayish or reddish, darker toward the base, hollow, sometimes with a dark belt of spores near the top; gills adnexed, blackish, broad; spores black, elliptic or spindle-shaped, 11-14 × 7μ. The name refers to the veins and cracks on the cap.

Frequent on dung, spring to autumn; excellent.

### Panaéolus campanulátus Bell Panaeolus

Cap 1-3 cm. wide, gray-brown or brownish, smooth, sometimes margined by fragments of the veil, bell-shaped; stem 8-15 cm. by 2-5 mm., reddish, powdered toward the top, hollow; gills adnexed or touching, blackish; spores black, ellipsoid, 14-18 × 9-12$\mu$. The name refers to the shape of the cap.

Common on dung or in manured soil, summer and autumn; said by McIlvaine to be edible but it should be tried with caution.

### Panaéolus papilionáceus Globe Panaeolus

Cap 1-4 cm. wide, whitish-gray, gray or yellowish, smooth, more rarely scaly, hemispheric; stem 7-12 cm. by 2-5 mm., whitish, rarely reddish-tinged, mealy above, hollow; gills adnate, black, very broad; spores black, ellipsoid, 15-18 × 7-8$\mu$. Meaning of name not evident.

Common on dung or in rich soil, spring to autumn; suspected.

#### ANELLARIA

Related to Panaeolus but distinguished by the presence of a distinct ring, which often disappears in age. Our one species is common, growing on dung. The name refers to the ring.

### Anellária separáta Bell Anellaria

PLATE II: 8

Cap 3-5 cm. wide and high, whitish or yellowish, smooth, sticky, shining, persistently bell-shaped or hemispheric; stem tall, 12-20 cm. by 4-6 mm., whitish or yellowish, smooth, hollow, ring distinct, small; gills touching or adnexed, blackish or gray-black, broad, crowded; spores black, ellipsoid to fusiform, 16-22 × 10-15$\mu$. Meaning not evident.

Common on dung, spring to autumn; excellent when not too old.

#### PSATHYRELLA

Distinguished from Panaeolus and Anellaria by the striate thin cap and the margin not extending beyond the gills. It lacks both ring and veil fragments at the margin. The gills are gray-black but not mottled. Our species are all small and edible. The name refers to its resemblance to Psathyra among the purple-spored forms.

### Psathyrélla disseminata Tuft Psathyrella

Cap 1-2 cm. wide, yellowish, grayish or pale brownish, finely scurfy, then smooth, distinctly striate, and more or less furrowed, thin, bell-shaped; stem 2-4 cm. by 1-2 mm., whitish, yellowish or grayish, mealy or smooth, more or less curved,

hollow; gills adnate, black; spores dark, ellipsoid, 6-19 × 3-5μ. The name refers to its abundance.

Common on and about old trunks, etc., spring to frost; excellent.

### GOMPHIDIUS

Characterized by the black fusoid spores and decurrent gills, which separate more or less readily into two halves. A veil is present and is usually more or less sticky. The cap is typically covered with a very sticky slime. This genus has points of resemblance with Cortinarius and with Hygrophorus. So far as known all the species are edible. The name refers to the peg-like form.

FIGURE 52. PSATHYRELLA DISSEMINATA

### Gomphídius víscidus Sticky Gomphidius

PLATE II: 9

Cap 5-10 cm. wide, red-brown, sticky, shining when dry, bell-shaped, then convex, plane or slightly depressed, more or less umbonate; stem 6-10 cm. by 1-2 cm., yellowish or reddish, more or less fibrous and somewhat sticky, solid, curtain cobwebby, scarcely sticky, often forming a faint ring, then disappearing; gills long decurrent, brown-purple, often with an olive tinge, somewhat grown together; spores dark, oblong to fusoid, 16-23 × 6-8μ. The name refers to the sticky cap.

Common on the ground in woods, summer and autumn; edible.

## PORE FUNGI POLYPORACEAE

Many of these resemble the gill fungi in form, but they are distinguished by having the spores borne in tubes or pits, opening by pores, rather than on gills. They are often bracket-like or shelf-like, and in some forms are mere layers of pores encrusting twigs. In texture, they range from fleshy, as in Boletus, to tough, leathery, papery and woody. The family includes the great majority of the shelf fungi found on stumps and trunks. The fleshy species are usually edible, but some of them are reputed to be poisonous.

### KEY TO THE GENERA


| | | Page |
|---|---|---|
| 1. Cap fleshy, soft, decaying readily | | |
| a. Stem central | | |
| (1) Cap shaggy with large scales | **Strobilomyces** | 86 |
| (2) Cap smooth or scaly, not shaggy | **Boletus** | 87 |
| b. Stem excentric or lateral in our species | | |
| (1) Tubes free but touching each other | **Fistulina** | 92 |
| (2) Tubes united to each other | **Boletinus** | 92 |
| 2. Cap tough-fleshy, leathery, papery or woody, not decaying readily | | |
| a. Tubes with pore-like openings | | |
| (1) Tubes in several layers; cap woody, perennial | **Fomes** | 93 |
| (2) Tubes in a single layer; cap tough-fleshy to leathery | | |
| (a) Cap thick, tough-fleshy to leathery | **Polyporus** | 95 |
| (b) Cap thin, leathery or papery | **Polystictus** | 99 |
| b. Tubes angled or oblong, not pore-like, often gill-like | | |
| (1) Tubes angled, in radiating rows | **Favolus** | 100 |
| (2) Tubes gill-like, radiating | **Daedalea** | 100 |
| (3) Tubes gill-like, concentric | **Cyclomyces** | 102 |


### STROBILOMYCES

Cap fleshy, with large scales, the stem central. Closely related to Boletus, but distinguished by the conspicuous scales, and the greater difficulty with which the layer of tubes separates from the flesh of the cap. The name refers to the characteristic thatch of scales.

### Strobilómyces strobiláceus Pore Cone

Cap 5-10 cm. wide, densely covered with large, hairy, black-brown or blackish scales, which project beyond the margin as a curtain, hemispheric or bell-shaped to convex; flesh whitish, changing to reddish and blackish when bruised; stem 7-12 cm. by 1-2 cm., blackish, scaly-hairy, solid; tubes adnate, whitish, then brownish

or blackish, with the color changes of the flesh when wounded; spores blackish, globoid, rough, 10-13$\mu$. The name refers to the cone-like cap.

On the ground in woods and openings, in groups or clusters; it is of excellent quality, but the stem and tubes should not be used.

### BOLETUS

Characterized by the fleshy cap from which the layer of tubes may be peeled readily, and by the central stem. It also differs from Strobilomyces, which has a central stem, by the lack of the large, conspicuous scales. Boletus is the typical fleshy genus of the pore fungi. It contains a large number of species, which are widely distributed. Many of the species are reputed to be poisonous, but McIlvaine says that he thinks this has often arisen from mere suspicion and not from actual test.

FIGURE 53. STROBILOMYCES STROBILACEUS

Caution should be exercised in trying any species of the genus, however, because of the varying susceptibility of different people. The species are very variable, and almost impossible for the beginner. Ancient name of a fungus.

## Key to the Species

1. Tubes yellowish, with reddish or red-brown mouths; flesh becoming blue when bruised
   - a. Flesh white or whitish; stem yellow — *B. vermiculosus*
   - b. Flesh yellow; stem red — *B. luridus*
2. Tubes of one color, or at least the mouths not reddish
   - a. Stem with net-like veins
     - (1) Tubes white, then flesh-colored

(a) Cap black or blackish; taste mild — *B. nigrellus*
(b) Cap yellowish to brown or chestnut; taste bitter — *B. felleus*
(2) Tubes not flesh-colored, free; cap reddish or brownish, smooth — *B. edulis*
b. Stem without net-like veins
(1) Cap sticky when moist
(a) Tubes adnate, yellow
x. Stem dotted above the large ring — *B. luteus*
y. Stem dotted above and below the sticky ring — *B. subluteus*
(b) Tubes free, whitish or grayish; stem rough-scaly — *B. scaber*
(2) Cap not sticky when moist
(a) Stem spongy, then more or less hollow; flesh blue where bruised — *B. cyanescens*
(b) Stem solid
x. Tubes changing to blue where bruised, adnate
(x) Cap and stem whitish or brownish white — *B. pallidus*
(y) Cap dark red; stem red, yellow above — *B. bicolor*
y. Tubes not changing to blue, free; cap orange-red — *B. versipellis*

### Bolétus vermiculósus Scaly Boletus

Cap 6-12 cm. wide, yellowish or reddish brown, more or less rough hairy or scaly, sometimes smooth, dry, convex, flesh whitish, turning blue where bruised; stem 5-10 cm. by 1-2 cm., yellowish, nearly smooth, solid; tubes nearly free, yellowish, mouths brownish orange, then blackish, changing to blue when bruised; spores yellow-brown, elliptic, 10-12 × 4-5$\mu$. The name has no evident application.

On the ground in woods, summer and autumn; not tested.

### Bolétus lúridus Lurid Boletus

Cap 5-10 cm. wide, olive-brown to sooty, somewhat sticky, more or less hairy, convex; flesh yellow, turning blue where bruised; stem 5-8 cm. by 1-2 cm., bright red or vermilion, orange above, netted or dotted, solid; tubes free, yellow, then greenish, mouths red, then orange; spores greenish, elliptic, 15 × 9$\mu$. The name refers to the color.

On the ground in leaf mold, summer and autumn. This species is of bad repute, but McIlvaine has eaten it and calls it delicious. It should be most carefully tried by the beginner.

### Bolétus nigréllus Black Boletus

Cap 7-15 cm. wide, blackish, dry, smooth or nearly so, convex to plane; flesh white, unchanging; stem 3-6 cm. by 1-2 cm., blackish or paler than the cap,

smooth; tubes adnate, whitish, then pinkish, turning blackish where bruised; spores dull pink, elliptic, 10-12 × 5-6$\mu$. The name refers to the color.

On the ground in woods, summer and autumn; excellent.

### Bolétus félleus Gall Boletus

Cap 7-20 cm. wide, yellowish to yellowish-brown, or red-brown, smooth, convex to plane; flesh white, sometimes becoming pinkish where bruised, bitter; stem 5-10 cm. by 1-2 cm., like the cap in color or somewhat paler, smooth, some-

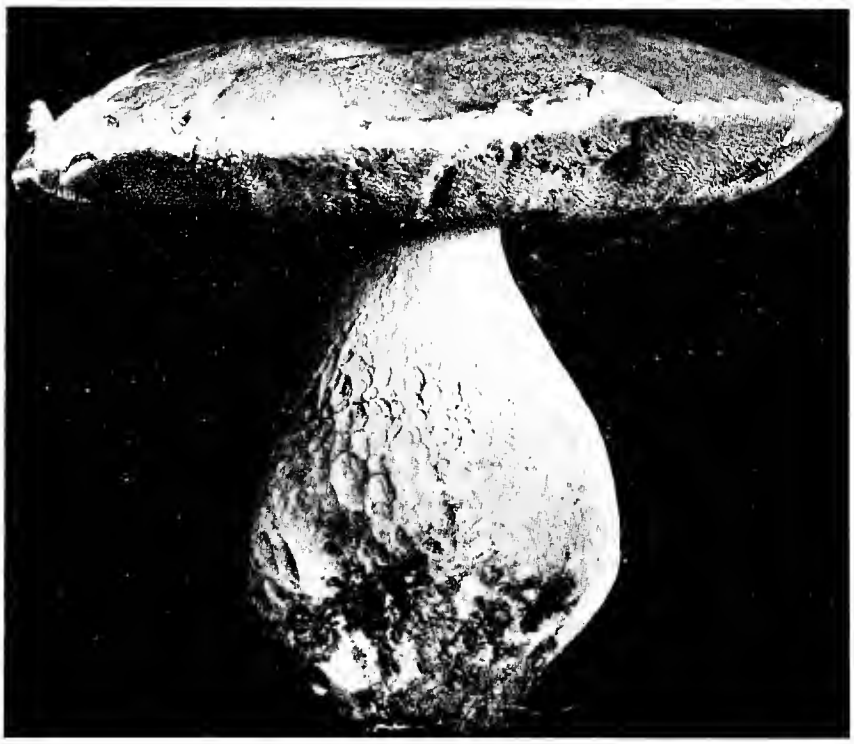

FIGURE 54. BOLETUS EDULIS

what netted above; tubes adnate, white, mouths tinted with pinkish; spores pinkish, oblong to fusoid, 12-18 × 4-5$\mu$. The name refers to the bitter taste.

Common on the ground in woods, summer and autumn; not poisonous, but too bitter to be edible.

### Bolétus edúlis Edible Boletus

Cap 8-15 cm. wide, grayish-, yellowish- or brownish-red, sometimes paler toward the edge, smooth, convex to plane; flesh whitish or yellowish, or somewhat reddish just below the skin; stem 5-15 cm. by 1-4 cm., whitish to brownish, more or less

net-veined, stout and often bulbous; tubes almost free, whitish, finally yellowish or greenish; spores yellowish, oblong to fusoid, 10-16 × 3-6μ. The name refers to the edible properties.

In woods and openings, summer and autumn; excellent.

### Bolétus lúteus Yellow Boletus

Cap 5-15 cm. wide, yellow to yellowish brown or brownish, covered with a dense brownish glue, more or less spotted, convex to plane; flesh white, unchanging; stem 5-6 cm. by 1-2 cm., yellowish or darkish and rough-dotted above the membranous brownish ring; tubes adnate, yellow, darker when old; spores yellow-brown, fusoid, 6-10 × 2-3μ. The name refers to the color.

Common on the ground in woods, summer and autumn; famed for its good qualities.

### Bolétus sublúteus Yellowish Boletus

Cap 3-8 cm. wide, dull yellow to rust-brown, sticky when wet, more or less spotted, convex to plane; flesh whitish to yellowish; stem 3-7 cm. by 4-7 cm., grayish to yellowish, rough-dotted above and below the ring with red-brown dots; veil sticky, finally forming a band-like ring; tubes adnate, yellow, then ocher; spores yellowish-rust-colored, fusoid, 8-10 × 4-5μ. The name refers to its relationship to Boletus luteus.

On the ground in woods, summer and autumn; good.

### Bolétus scáber Roughstem Boletus

Cap 3-12 cm. wide, extremely variable in color, from tan to brickred, orange-red, smoky, brown, etc., smooth, sticky when wet, convex; flesh white or whitish, changing little when bruised; stem 6-12 cm. by 6-12 mm., whitish to gray, rough with red-brown or blackish scales, solid; tubes free, white, then darkish; spores brownish, fusoid, 14-18 × 4-6μ. The name refers to the rough stem.

One of the commonest of the genus, in woods, marshes, etc., summer and autumn; excellent, though stem and tubes should usually not be cooked, as they require a longer period.

### Bolétus cyanéscens Blueflesh Boletus

Cap 5-15 cm. wide, grayish tan, tan or brownish, more or less tufted or hairy, convex to plane; flesh white, turning blue where bruised; stem 5-10 cm. by 1-3 cm., tan to brownish, grayish with fine hairs, stuffed, then hollowed; tubes free, white, then yellowish, turning blue when touched; spores whitish or pale yellow, ellipsoid, 15-16 × 5-8μ. The name refers to the bluing of the flesh.

In woodland and grassland, summer and autumn; excellent.

FIGURE 55. BOLETUS VERSIPELLIS

### Bolétus pállidus Pale Boletus

Cap 5-10 cm. wide, pale or brownish white, smooth, convex to plane or slightly depressed; flesh white; stem 7-12 cm. by 1-2 cm., whitish, sometimes with brownish streaks, smooth; tubes more or less adnate, pale or faint yellowish, changing to blue when bruised; spores yellowish brown, ellipsoid, 10-12 × 5-6$\mu$. The name refers to the color.

On the ground in woods, summer and autumn; excellent.

### Bolétus bícolor Redyellow Boletus

Cap 5-10 cm. wide, dark red or red-brown, paler in age and somewhat spotted with yellow, smooth or somewhat powdered, convex; flesh yellow, unchanging, or changing slightly to blue where bruised; stem 3-7 cm. by 8-12 mm., red, more or less yellow above, smooth, solid; tubes adnate, bright yellow, then ocher, slowly turning blue where bruised; spores yellow-brown, ellipsoid, 10-13 × 4-5$\mu$. The name refers to the two colors of cap and stem.

Common on the ground in woods, summer and autumn; one of the best of the genus.

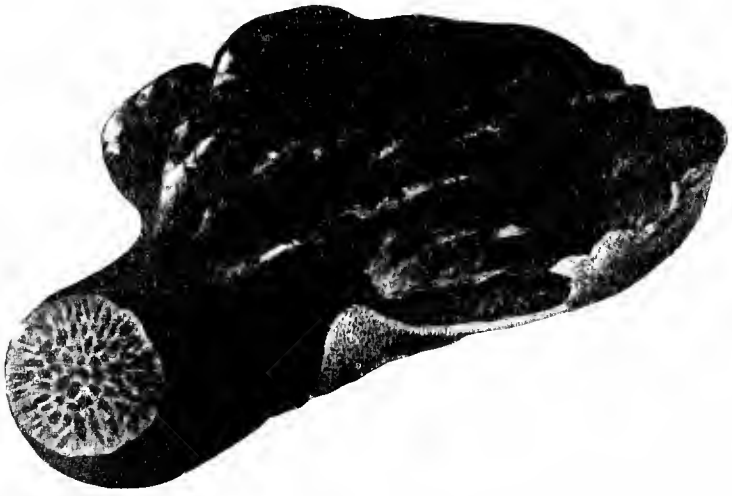

FIGURE 56. FISTULINA HEPATICA

### Bolétus versipéllis Orange-red Boletus

Cap 5-20 cm. wide, orange-red or bright red-brown, smooth or somewhat downy or scaly, not sticky, convex, usually with fragments of the veil at the margin when young; flesh white, with a tint of green; stem 7-20 cm. by 1-4 cm., whitish or grayish, with irregular blackish lines or wrinkles, solid; tubes free or nearly so, dull white or gray; spores pale yellowish, fusoid, 14-20 × 5-8$\mu$. The name is without obvious application.

Common on the ground in open woods, summer and autumn; excellent.

### FISTULINA

Distinguished by the free or separate tubes, from the preceding and the following genera. It also differs from Boletus in having a lateral or very short stem, and in growing on wood. The one common species has long been celebrated as an edible fungus. The name refers to the separate tubes.

### Fistulína hepática Beefsteak Fungus

Cap 8-20 cm. wide, bright red or red-brown, liver-shaped to shelf-like, more or less lobed, smooth, more or less sticky when wet; flesh containing reddish fibers; stem short, lateral and almost wanting, or sometimes long and excentric;

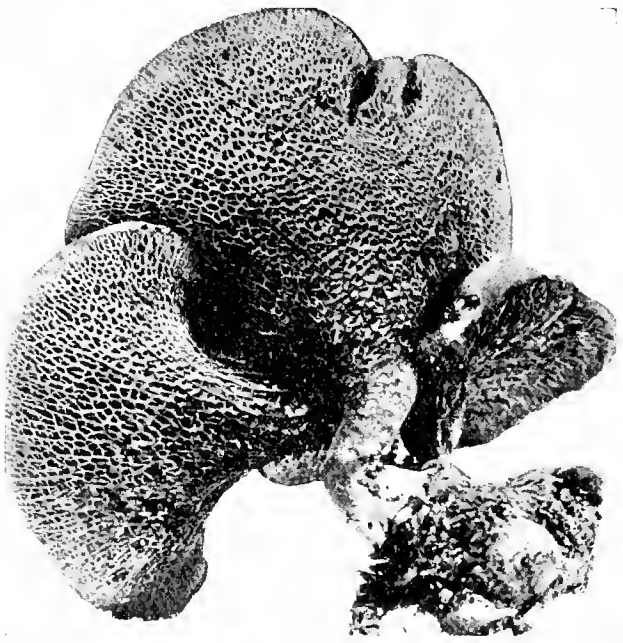

FIGURE 57. BOLETINUS POROSUS

tubes pale to yellowish or pinkish; spores yellowish to pinkish, ellipsoid, 5-7 × 3-4$\mu$. The name refers to the form and color of the cap.

On stumps and trunks of hardwoods, from spring to frost; excellent in the opinion of most mycophagists.

### BOLETINUS

Distinguished from Boletus and Strobilomyces by the difficulty with which the pores separate from the cap, and from Fistulina by the pores being firmly united into radiating rows. In our species the stem is excentric or lateral. All of the species tested are edible. The name refers to the similarity to Boletus.

### Boletínus porósus Veined Boletinus

Cap 5-12 cm. wide, yellow-brown, brown or red-brown, smooth and shining, sticky when wet, plane to depressed, usually incomplete and irregular, becoming more or less shelf-like; flesh whitish or yellowish; stem lateral or excentric, 1-3 cm. by about 1 cm., like the cap in color, expanding into the cap and hence netted above by the decurrent tubes; tubes in radiating rows with more prominent lines between, yellowish brown; spores yellowish, ovoid, 9-11 × 6-8μ. The name refers to the appearance of the tubes.

Common on the ground in woods, summer and autumn; edible.

## FOMES

Cap thick, woody, bracket- or shelf-like, perennial, showing usually several annual rings or zones of growth. Closely related to Polyporus and Polystictus but distinguished by the thick perennial cap. The plants are too woody to be edible, but they are of much importance, owing to the damage which they do to standing trees, upon which they grow. The name refers to the thick, almost swollen cap.

### Key to the Species

| | | |
|---|---|---|
| 1. | Pore surface covered by a distinct veil, or volva | *F. volvatus* |
| 2. | Pore surface without a veil | |
| a. | Cap large and shelf-like | |
| (1) | Cap smooth and whitish or white | *F. applanatus* |
| (2) | Cap rougher, red-brown or dark brown | *F. pinicola* |
| b. | Cap more or less hoof-like | |
| (1) | Cap reddish brown, pale within | *F. fraxinophilus* |
| (2) | Cap black or brownish black, brown within | *F. igniarius* |

### Fómes volvátus Volvate Fomes

Cap 1-3 cm. wide, whitish or yellowish, more rarely brownish, smooth, shining, zoneless, stemless, or with a very small knob-like stem, thick, globoid or ovoid, more or less shelving; pores covered for some time by a membrane which persists at the margin, brownish or brown; spores ellipsoid, pinkish, 9-12 × 5-6μ. The name refers to the volva-like membrane.

On trunks of spruce and fir, persisting from year to year.

### Fómes applanátus Shelf Fomes

Cap 20-40 cm. wide, whitish or yellowish, more rarely brownish, smooth, with a firm crust, woody, zoned, shelf-like, stemless; pores tiny, whitish to rust-brown; spores rarely present. The name refers to the shelf-like cap.

Common on trunks of trees, typically deciduous species; perennial.

### Fómes pinícola Pine Fomes

C a p 15-30 cm. wide, red-brown or dark brown, rough, corky-woody, without a distinct crust, swollen, shelf-like; p o r e s small, whitish to yellowish; s p o r e s rarely found. The name refers to the host.

Common on the trunks of conifers; perennial.

FIGURE 58. FOMES APPLANATUS

### Fómes fraxinóphilus Ash Fomes

C a p 5-10 cm. wide, grayish to red-brown, somewhat downy, corky, without a crust, more or less cracked, pale within; p o r e s small, round, whitish or yellowish; s p o r e s pale, ellipsoid, 7-9 × 6-7$\mu$. The name refers to the host.

Common on the trunks of deciduous trees, especially ash; perennial.

### Fómes igniárius Punkwood Fomes

Cap 8-10 cm. wide, blackish or black, more rarely dark brown, more or less hairy and roughened, rust-brown within; pores tiny, brown; spores clear, globoid, 6-7$\mu$. The name refers to its use as punkwood.

Frequent on tree trunks; perennial.

## POLYPORUS

Cap thickish, tough-fleshy to leathery, more rarely woody, not perennial, central-stemmed to excentric or shelf-like. Closely related to Fomes and Polystictus, from which the woody and leathery species respectively are separated with difficulty. One of the commonest of fungus genera, found everywhere on stumps and logs. The fleshy species are all more or less edible. The name refers to the porous surface.

FIGURE 59. FOMES PINICOLA

### Key to the Species

1. Cap with central, excentric or lateral stem
   a. Caps more or less single and stems distinct
      (1) Cap small, 2-10 cm., leathery
         (a) Cap smooth or scaly; stem hairy — *P. brumalis*
         (b) Cap ciliate or hairy at the margin; stem slightly scaly — *P. arcularius*
      (2) Cap large, 10-50 cm., tough-fleshy
         (a) Cap scaly, whitish to yellowish — *P. squamosus*
         (b) Cap smooth, brownish to dark brown — *P. picipes*
   b. Caps densely clustered and stems united
      (1) Caps regular, depressed; stems distinct except toward base — *P. umbellatus*

(2) Caps one-sided, very irregular; stems much fused — *P. frondosus*

2. Cap stemless or nearly so, shelf-like
   a. Cap large, soft, fleshy, overlapping in dense clusters — *P. sulphureus*
   b. Cap more or less corky or woody, single or clustered
      (1) Cap 5-10 cm., corky to woody
         (a) Cap gray or smoke-colored — *P. adustus*
         (b) Cap brown or rust-brown — *P. gilvus*
         (c) Cap orange or vermilion — *P. cinnabarinus*
      (2) Cap 10-30 cm., whitish to reddish brown, fleshy at first — *P. betulinus*

### Polýporus brumális Winter Polyporus

Cap 2-10 cm. wide, grayish to soot-colored, smooth or slightly scaly, tough-fleshy to leathery, more or less depressed; stem 2-5 cm. by 4-8 mm., grayish, hairy or scaly; pores more or less angled, somewhat toothed, whitish; spores clear, oblong, curved, 6 × 2μ. The name refers to the late appearance, often in winter.

Common on decaying twigs and branches in woodland; too tough to be edible.

### Polýporus arculárius Fringed Polyporus

Cap 1-4 cm. wide, yellow-brown to dark brown, somewhat finely scaly, long-hairy or ciliate at the margin, tough-fleshy, depressed or umbilicate; stem 1-3 cm. by 2-4 mm., gray-brown to brown, finely scaly; pores angled, large, entire, white; spores clear, ellipsoid, 6-7 × 3-4μ. The name refers to the form.

Common on decaying twigs in woodland and thickets; edible when young, but rather tough.

### Polýporus squamósus Scaly Polyporus

Cap 10-50 cm. wide, yellowish or grayish yellow, covered with broad flat darker scales, tough-fleshy, fan-shaped or irregular; stem excentric 1-4 cm. by 1-3 cm., usually lateral, netted above, blackish downward; pores angled or torn, white or pale; spores clear, ovoid, 12 × 5μ. The name refers to the scaly cap.

Occasional on the ground in woods; said to attain a width of 7 feet and a weight of 40 pounds. Tough, but with a pleasant flavor, according to McIlvaine.

### Polýporus pícipes Blackstem Polyporus

Cap 10-30 cm. wide, pale brown to rust-brown or chestnut, smooth, fleshy-leathery, more or less funnel-shaped, incomplete, lobed, often imbricated; stem 2-5 cm. by 1-3 cm., excentric or lateral, downy, then smooth, black; pores small, white or yellowish; spores globoid, 3-4μ. The name refers to the pitch-black stem.

On decaying stumps or logs; when young, of a delicate flavor.

### Polýporus umbellátus Funnel Tuft

Caps 1-4 cm. wide, in dense tufts 15-20 cm. wide, smoky, yellowish or reddish, smooth, tough-fleshy, regular, more or less depressed and funnel-form; stems 1-3 × ½-2 cm., often forking at the top, joined into a dense mass at the base; pores small, white. The name refers to the umbrella-like tops.

On decaying wood and stumps; well-flavored.

### Polýporus frondósus Fan Tuft

Caps 1-5 cm. wide, tufts 15-30 cm. wide, gray to smoky, wrinkled or smooth, firm-fleshy, fan-shaped, lobed and variously irregular; stems grown together into a

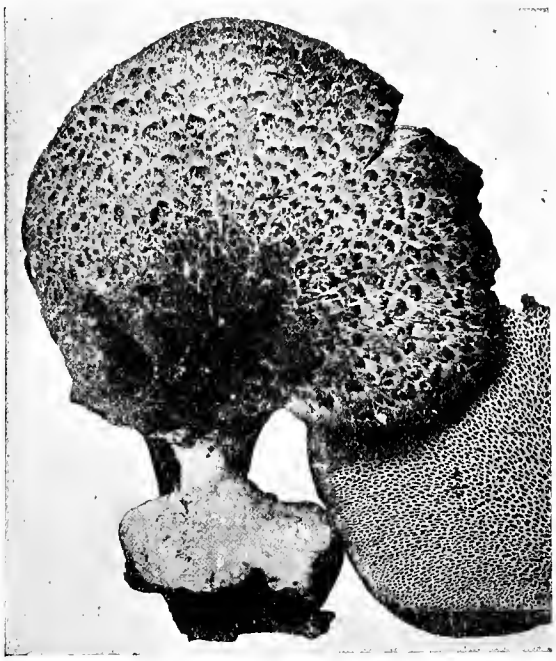

FIGURE 60. POLYPORUS SQUAMOSUS

dense mass, or more or less separate; pores very small, white. The name refers to the leaf-like cap.

On decaying stumps and roots; tender when young, and well-flavored.

### Polýporus sulphúreus Sulphur Polyporus

Caps 10-20 cm. wide, yellowish, reddish yellow or orange, undulate on top, smooth, fleshy-spongy, fan-shaped or shelf-shaped, imbricated, more or less lobed and irregular; stem usually lacking, or short and lateral; pores small, sulphur-colored; spores clear, ovoid, slightly roughened, 7-8 × 4-5$\mu$. The name refers to the color.

On decaying stumps and on trunks of living trees; delicious when fresh.

### Polýporus adústus Smoky Polyporus

Cap 5-10 cm. wide, gray or smoky, more or less hairy, then smooth, tough, woody when old, shelf-like; pores small, round, whitish, then dark gray, or blackish; spores elliptic, 4-5 × 2$\mu$. The name refers to the color.

On decaying stumps, logs, etc.; too tough to be of value.

### Polýporus gílvus Rustbrown Polyporus

Cap 5-10 cm. wide, rust-brown or brown, tough, woody, smooth, uneven, shelf-like; pores small, rust-brown. The name refers to the color.

On decaying stumps, logs, etc., common everywhere; of no value.

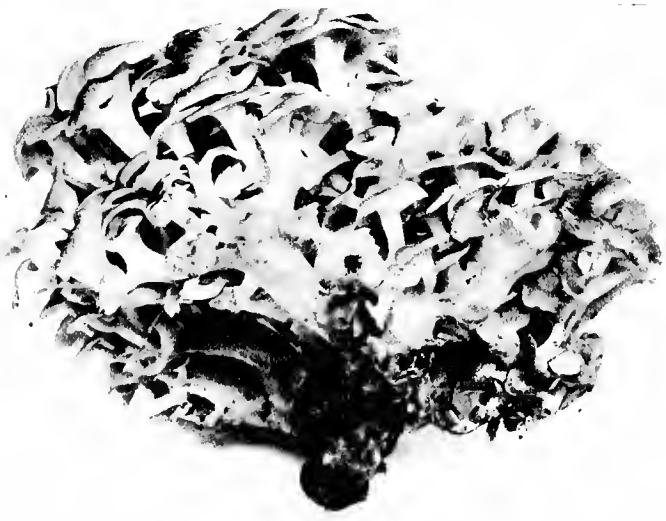

FIGURE 61. POLYPORUS UMBELLATUS

### Polýporus cinnabarínus Orange Polyporus

Cap 2-7 cm. wide, orange or vermilion, paler with age, smooth or downy, wrinkled, slightly zoned, corky, shelf-like; pores round, bright vermilion. The name refers to the color.

Common on decaying wood; of no value.

### Polýporus betulínus Birch Polyporus

Cap 10-30 cm. wide, whitish-brown to reddish-brown, tough-fleshy, then corky, smooth, zoneless, with a thin distinct skin, swollen, shelf-like; pores short, small, white to brownish, with hair-like scales on the pore-surface when mature; spores clear, oblong, curved, 4-5$\mu$. The name refers to its host.

On roots and stems of birches; edible when young.

### POLYSTICTUS

Closely related to Polyporus, so closely in fact that it is impossible to draw a sharp line between them. The cap is usually thinner and more papery, and the pores develop from the back to the edge. The cap is usually shelf-like, and so tough as to be of no value as food. The name refers to the many pores.

### Key to the Species

1. Cap white, zoneless — *P. pergamenus*
2. Cap with distinct concentric zones
   a. Cap many-colored — *P. versicolor*
   b. Cap white or whitish — *P. hirsutus*

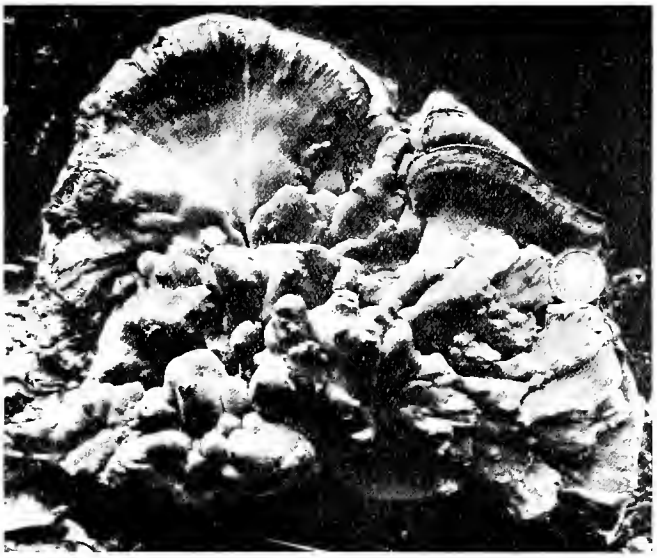

FIGURE 62. POLYPORUS SULPHUREUS

#### Polystictus pergaménus Paper Polystictus

Cap 2-8 cm. wide, white or whitish, downy or smooth, leathery or papery, rigid, often concentrically furrowed, but not zoned, shelf-like and imbricated; pores whitish or grayish, finely toothed. The name refers to the papery texture.

Very common on trunks and stumps.

#### Polystictus versícolor Rainbow Polystictus

Cap 2-10 cm. wide, extremely variable in color, distinctly zoned, with different colors, velvety or silky, leathery, densely imbricated, shelf-like; pores small, round, torn, white to gray or yellowish. The name refers to the many colors of the cap.

Everywhere on stumps and logs.

### Polystíctus hirsútus Hairy Polystictus

Cap 2-10 cm. wide, uniformly of one color, white, whitish or grayish, leathery, coarsely hairy, concentrically zoned, shelf-like, imbricated; pores white to darkish; spores elliptic, 4-5 × 2μ.

Common on stumps and logs.

#### FAVOLUS

Distinguished by the beautifully diamond-like radiating pores. The texture is leathery or papery, and the stem lateral or absent. Closely related to Polystictus and Polyporus. The name refers to the honey-comb appearance of the pores.

FIGURE 63. POLYPORUS BETULINUS

### Fávolus canadénsis Honeycomb Fungus

Cap 4-6 cm. wide, tawny or pale rust-colored, scaly or smooth, fleshy, then leathery, with a very short lateral stem or none at all; pores oblong-angled, or honey-comb-like, white, then yellowish; spores oblong, 12-7μ. The name refers to the country where the plant was first discovered.

Common on twigs on the ground, especially in autumn; too tough to be of value.

#### DAEDALEA

The pores are long and narrow, often resembling gills, or in some species becoming so torn in age as to appear like teeth. Resembling Polyporus in form and texture, but easily distinguished as a rule by the maze of gill-like pores. In some

plants, the pores have become perfect gills, and such plants are readily mistaken for Lenzites. Named for Daedalus, builder of the Cretan labyrinth.

FIGURE 64. POLYSTICTUS PERGAMENUS

### Key to the Species

1. Pores becoming more or less gill-like
   a. Cap grayish or pale brownish *D. quercina*
   b. Cap deep brown or red-brown *D. confragosa*
2. Pores at length torn into fine teeth *D. unicolor*

### Daedálea quercína Oak Daedalea

Cap 5-12 cm. wide, grayish to pale brownish, zoneless, smooth or nearly so, wrinkled, corky, shelf-like or nearly circular; pores becoming oblong, gill-like and labyrinthine, pale or slightly pinkish. The name refers to the host.

Frequent on stumps, especially of the oak; of no value.

### Daedálea confragósa Brown Daedalea

Cap 3-8 cm. wide, brown or red-brown, somewhat zoned, rough, corky, shelf-like; pores oblong, gill-like and labyrinthine, red-brown. The name is of doubtful application.

Frequent on stumps and trunks; of no value.

### Daedálea unícolor Toothed Daedalea

Cap 1-5 cm. wide, whitish to grayish or brownish, woolly, leathery, zoned, shelf-like and more or less

densely imbricated; pores soon breaking up into fine teeth, grayish to brownish. The name refers to the uniformly colored cap.

Very common on trunks, stumps, twigs, etc.; of no value.

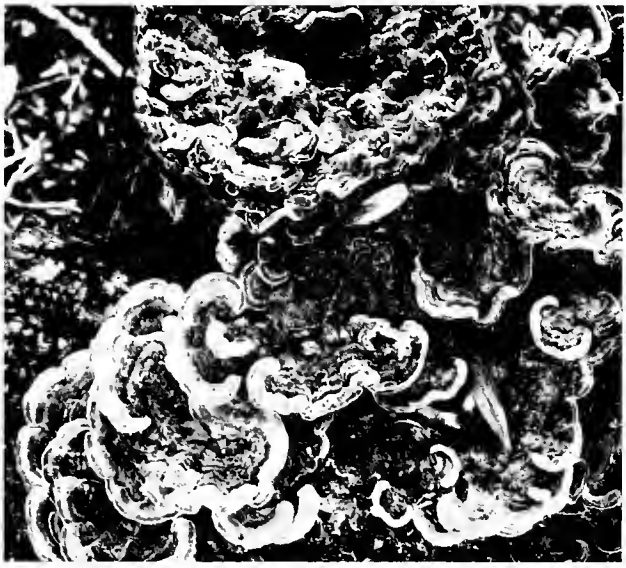

FIGURE 65. POLYSTICTUS HIRSUTUS

### CYCLOMYCES

Pores long, narrow and gill-like, but concentric in place of radiate, as in all the preceding. In old age, the partitions disappear, and the plant appears to be a gill fungus with concentric gills. Our species has a central stem. The cap is more or less fleshy, but it is not known to be edible. The name refers to the cyclic gills or pores.

FIGURE 66. FAVOLUS CANADENSIS

### Cyclómyces greénei Circle Gill

Cap 5-8 cm. wide, brown, downy, zoned, more or less streaked at the margin, globose, then convex to plane, more or less tough, fleshy; stem central, 4-6 cm. by 1 cm., dark brown, broader above; pores gill-like, decurrent, grayish.

On the ground.

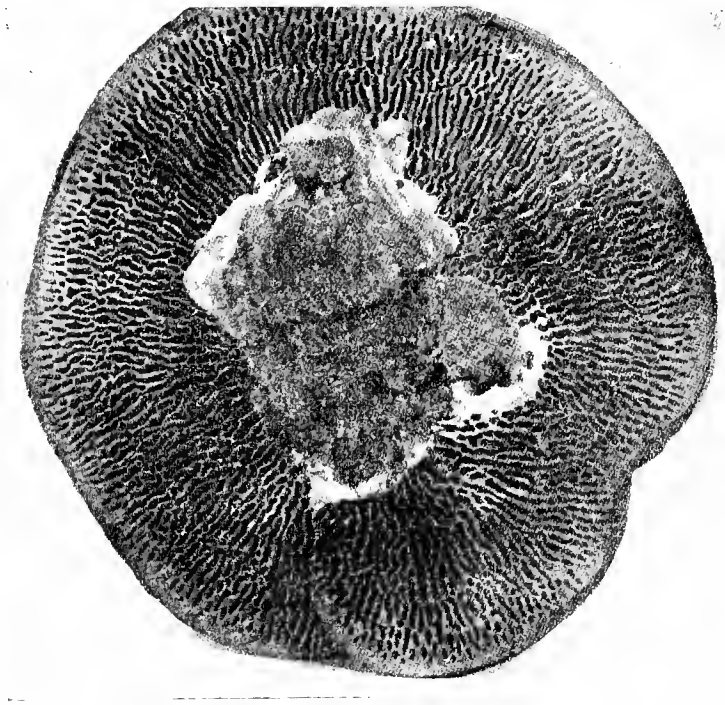

FIGURE 67. DAEDALEA QUERCINA

## TOOTH FUNGI HYDNACEAE

Distinguished by teeth or spines, which take the place of gills or tubes in forming the hymenium or spore surface. In form and texture, the tooth fungi resemble the pore fungi very closely, ranging from fleshy central-stemmed forms to leathery shelf-like or inverted ones. The fleshy forms are all more or less edible.

### KEY TO THE GENERA


| | | | Page |
|---|---|---|---|
| 1. | Teeth free to the base; mostly fleshy plants | **Hydnum** | 104 |
| 2. | Teeth united below; inverted leathery plants | **Irpex** | 107 |

FIGURE 68.
CYCLOMYCES GREENEI

## HYDNUM

Cap fleshy or tough-fleshy, rarely leathery, central- or lateral-stemmed, stemless, tufted or inverted; the spore-surface consisting of spines or teeth. The stemmed, and coral-like forms are the most common. They are all edible. The name is the ancient Greek name of an edible fungus.

### Key to the Species

1. Stem central or lateral
   a. Stem central; on the ground
      (1) Cap shaggy with large imbricated scales — *H. imbricatum*
      (2) Cap smooth or nearly so
         (a) Cap and teeth tan to brownish — *H. repandum*
         (b) Cap and teeth rust-colored — *H. zonatum*
   b. Stem excentric or lateral; on cones or wood; black — *H. auriscalpium*
2. Stem lacking or indistinct; cap head-like or coral-like
   a. Cap greatly branched, more or less coral-like — *H. coralloides*
   b. Cap less branched, more head-like; teeth very large
      (1) Teeth in a uniform dense head — *H. erinaceum*
      (2) Teeth on smaller fused heads
         (a) Smaller heads more or less distinct — *H. caput-ursi*
         (b) Smaller heads indistinct, but giving an irregular appearance to the main head — *H. caput-medusae*

### Hýdnum imbricátum Tiled Hydnum

Cap 5-30 cm. wide, slate-colored to brown, shaggy with coarse more or less regular scales, often separated by deep cracks, firm-fleshy, convex to plane or slightly upturned; stem stout and short, 3-10 cm. by 2-4 cm., brownish; teeth decurrent, gray-brown to brownish, 8-12 mm. long; spores yellowish brown, roughened, 7 × 5$\mu$. The name refers to the large scales.

Common on the ground in pine and spruce woods; edible, though somewhat bitter when raw.

### Hýdnum repándum Buff Hydnum

Cap 3-12 cm. wide, yellowish or tan, rarely pinkish or brownish, smooth, fleshy, convex to plane, then somewhat depressed; stem 4-10 cm. by 1-3 cm., yellowish to whitish, smooth; teeth decurrent, buff, 6-8 cm. long; spores globose or angled,

pointed at one end, clear or yellowish, 5-8$\mu$. The name refers to the depressed cap.

Common on the ground in woods, usually in troops, summer and autumn; excellent, but requires to be cooked slowly for about an hour.

### Hýdnum zonátum Zoned Hydnum

Cap 2-5 cm. wide, rust-colored to rust-brown, smooth, distinctly zoned, thin, fleshy-leathery, more or less wrinkled radiately, plane, then more or less depressed; stem 1-3 cm. by 4-6 mm., hairy or tufted, somewhat paler than the cap, swollen at base; teeth 2-3 mm. long, rust-colored; spores globoid, rough, pale rust-brown, 3-4$\mu$. The name refers to the zoned cap.

On the ground in woods; used for flavoring, but too tough for food.

FIGURE 69. HYDNUM IMBRICATUM

### Hýdnum auriscálpium Black Hydnum

Cap 5-25 mm. wide, black-brown to black, coarse-hairy, leathery, kidney-shaped omewhat shelf-like; stem tall, slender, excentric or lateral, 5-8 cm. by 2 mm., k, hairy, rooting; teeth dark or blackish brown, tough; spores globoid, , 4-5 $\times$ 4$\mu$. The name refers to the form.

On cones or fragments of wood in the ground; too tough to be edible.

### Hýdnum coralloídes Tooth Coral

C a p 10-50 cm. wide, white, yellowish when old, repeatedly branched into a coral-like cluster, fleshy; t e e t h mostly on one side of the branches, 6-8 mm. long; s p o r e s globose, clear, 4-6$\mu$. The name refers to the coral-like head.

On decaying trunks, logs, etc., summer and autumn; excellent.

### Hýdnum erináceum Hedgehog Mushroom

C a p 5-30 cm. wide, white, then yellowish or somewhat brownish, the branches forming a dense head covered with teeth, fleshy; s t e m short and stout, 2-8 cm. long and thick, or entirely lacking; t e e t h 3-10 cm. long, densely crowded; s p o r e s globose, clear, 5-6$\mu$. The name refers to the appearance of the head.

On decaying trunks, stumps, etc., edible.

FIGURE 70. HYDNUM REPANDUM

### Hýdnum caput-úrsi Bear's Head

C a p 10-20 cm. wide and high, white, later yellowish, the individual branches more or less distinct, with more or less distinct tufts of teeth, fleshy; s t e m absent or a mere knob; t e e t h 2-3 cm. long. The name refers to the shaggy cap.

On decaying trunks and logs; edible.

### Hýdnum caput-medúsae Medusa Head

C a p 10-50 cm. wide by 5-20 high, white to grayish or yellowish, somewhat irregular, but the branches more or less completely hidden by the long teeth, fleshy; t e e t h 3-5 cm. long.

On decaying trunks and stumps; excellent.

## IRPEX

Distinguished from Hydnum by the teeth, which are united at the base. It differs from all the species of Hydnum described above in being stemless and inverted, forming a layer upon sticks and branches. When fresh, all the species are edible, though somewhat gelatinous. The name means a harrow, in reference to the teeth.

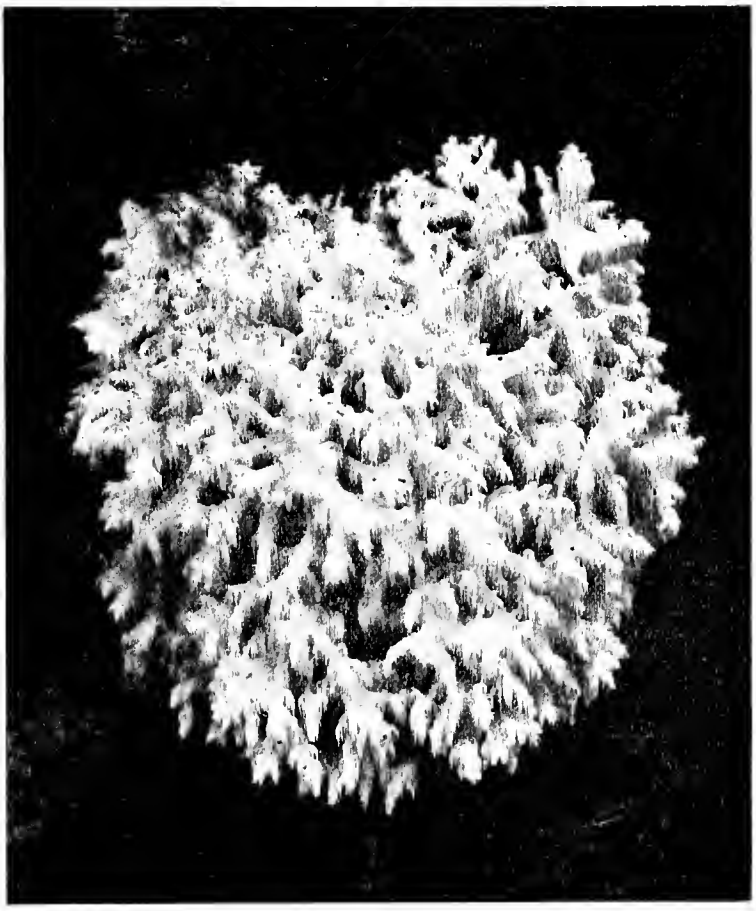

FIGURE 71. HYDNUM CORALLOIDES

### Key to the Species

1. Cap pinkish to reddish — *I. carneus*
2. Cap pure white — *I. lacteus*

### Irpex cárneus Reddish Irpex

Cap spread out in a layer, 2-8 cm. long, more or less irregular, thin, somewhat gelatinous, pinkish to reddish; teeth blunt, entire. The name refers to the color.

On dead or decaying branches of deciduous trees; edible when fresh.

### Irpex lácteus White Irpex

Cap a thin leathery layer, 2-7 cm. long, the upturned edge hairy, pure white; teeth acute, crowded, white. The name refers to the color.

On dead or decaying branches; probably edible, though somewhat tough.

## CORAL FUNGI CLAVARIACEAE

Cap greatly branched and coral-like or leaf-like, or less frequently club-shaped or head-shaped. The surface of the cap or its branches is smooth, thus distinguishing

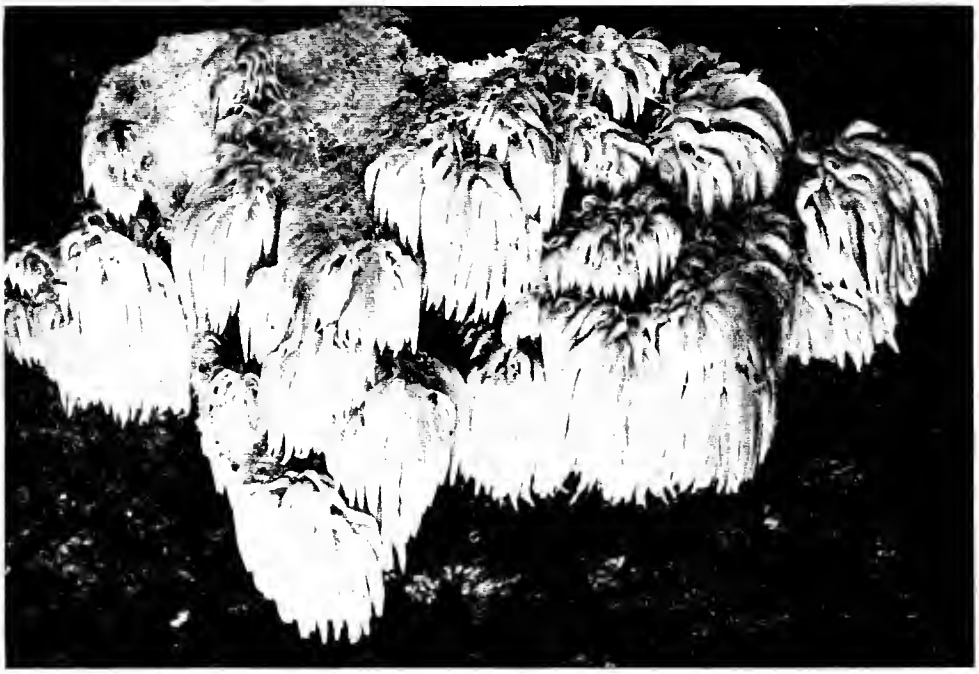

FIGURE 72. HYDNUM CAPUT-URSI

the coral-fungi from similar forms among the tooth fungi. Coral-like forms also occur among the jelly fungi, but are distinguished by their gelatinous or waxy texture. The club-shaped genera of the saddle-fungi can be distinguished only by means of the microscope, which reveals the presence of spore-sacs. Our species are all edible.

### KEY TO THE GENERA

| | | Page |
|---|---|---|
| 1. Cap much branched, or merely club-shaped | | |
| a. Cap with flat leaf-like branches | Sparassis | 109 |
| b. Cap with round branches, coral-like, or merely club-shaped | Clavaria | 109 |
| 2. Cap head-like, on a distinct stem | Physalacria | 113 |

### SPARASSIS

Cap much branched forming a dense rosette of flat leaf-like branches. Edible. The name means torn to pieces, and refers to the greatly branched cap.

### Sparássis crispa Leaf Coral

Cap 10-50 cm. wide by 6-30 cm. high, whitish to yellowish, the branches somewhat transparent, flat, curly at the edge, joined below into a root-like base; spores yellowish, ellipsoid, 5-6 × 3-4$\mu$. The name refers to the curled branches.

On ground in woodland and grassland, summer and autumn; delicious.

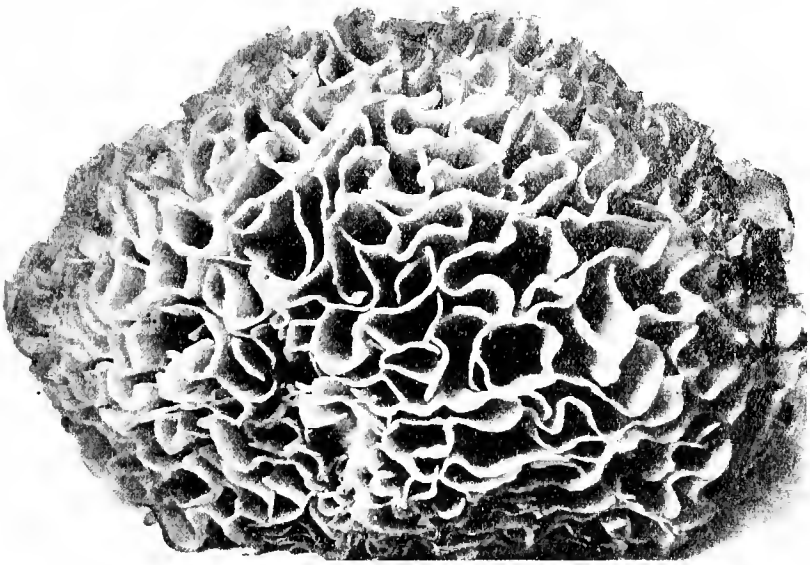

FIGURE 73. SPARASSIS CRISPA

### CLAVARIA

Cap greatly branched and coral-like, or simple and club-shaped, more or less fleshy or fleshy-leathery. The branches and clubs are usually rounded, somewhat flattened toward the tips, and there is no clear distinction between stem and cap, as in Physalacria. Our forms are edible; they grow on the ground or on wood. The name refers to the club-shaped plants or branches.

### Key to the Species

1. Cap branched, more or less coral-like
   a. On the ground
      (1) Cap white or whitish — *C. coralloides*

(2) Cap yellow or tan
(a) Spores whitish or pale — *C. flava*
(b) Spores yellow to brown — *C. formosa*
b. On wood
(1) Cap pale tan, with a reddish tint; spores whitish — *C. pyxidata*
(2) Cap pale yellow to brownish; spores yellow to brown — *C. stricta*
2. Cap little or not at all branched, cylindric to club-shaped
a. Caps usually simple, but in dense tufts or clumps, yellow — *C. inaequalis*
b. Caps simple, single or merely grouped, rarely slightly branched
(1) Cap club-shaped
(a) Cap 2-8 cm. tall — *C. ligula*
(b) Cap 8-30 cm. tall — *C. pistillaris*
(2) Cap cylinder-like, usually tapering upward
(a) Cap 5-10 cm. tall, on ground — *C. juncea*
(b) Cap 1-2 cm. tall, usually on wood — *C. mucida*

### Clavária coralloídes Coral Clavaria

Cap 5-12 cm. tall, white or whitish, stem thick, short, repeatedly branched, branches much forked, somewhat flattened, hollow, broadened, tips crowded, acute; spores yellowish, pointed, angled or globoid, 8-10 × 6-8μ. The name refers to the form.

Common on the ground in woods, summer and autumn; edible, but it should be used only when young. Clavaria cristata is not to be distinguished from this species, by the beginner at least.

### Clavária fláva Yellow Clavaria

Cap 6-12 cm. tall, pale yellow to dull yellow, stem stout, short, whitish, branches many, crowded, rounded, obtuse, the tips toothed, deeper yellow; spores whitish, ellipsoid, 8-10 × 4μ. The name refers to the color.

Common on the ground in woodland and clearings; excellent when young.

### Clavária formósa Redtip Clavaria

Cap 5-12 cm. high, yellow or yellowish, stem 3-4 cm. thick, whitish or yellowish, branches many, tall, crowded, yellow, the tips pink, red or orange when young; spores ocher, oblong, rough, 9-12 × 3-5μ. The name refers to the beauty of the plant.

Forming large tufts on the ground, summer and autumn; excellent when young.

FIGURE 74. CLAVARIA STRICTA

### Clavária pyxidáta Cuptip Clavaria

Cap 3-12 cm. tall, pale tan, often tinged with red, stem thin, small, branches erect, much-forked, the tips cup-like, with slender projections from the margin of the cups; spores globoid, 5 × 3μ. The name refers to the cup-like tips.

On decaying wood or on roots in the ground, summer and autumn; said to be edible.

This is probably C. pistillaris (Lloyd. Letter No. 44 p. 12).

FIGURE 75. CLAVARIA LIGULA

### Clavária stricta Wood Clavaria

Cap 5-10 cm. tall, yellowish to dull yellow or brownish, stem distinct, stout and short, branches many, much-forked, straight, crowded, tips acute; spores yellowish, ovoid, 6-8 × 3-5μ. The name refers to the erect straight branches.

On decaying wood, summer and autumn; fair.

### Clavária inaequális Yellow Tuft

Cap 5-8 cm. tall, bright yellow, cylindric and tapering or more or less club-shaped, simple or somewhat branched, more or less united at the base, fragile, stuffed; spores clear, ellipsoid or globoid, 10-12 × 5-8μ. The name has no evident application.

On the ground in woodland and grassland, late summer and autumn; excellent.

### Clavária língula Yellow Club

Cap 2-8 cm. tall, 5-12 mm. wide, yellowish, tan or even somewhat brownish, spongy-fleshy, dry, club-shaped, simple, more or less hairy at base; spores clear, ellipsoid, 10-12 × 3-5μ. The name refers to the shape of the cap.

Common in troops on the ground, especially among needles of conifers; edible.

### Clavária pistilláris Yellow Pestle

Cap 8-30 cm. tall, 3-6 cm. wide, yellowish, tan, reddish or even dark brown, spongy-fleshy, dry, club-shaped, more or less lobed or scalloped at the top; spores clear, ellipsoid, 10-14 × 5-8μ. The name refers to the form.

On the ground in woods, late summer and autumn; one of the best of the genus.

### Clavária júncea Rush Clavaria

Cap 5-10 cm. tall, ½-1 cm. wide, whitish to tan or reddish, fragile, fleshy, hollow, cylindric or rush-like, acute, somewhat hairy and bent at the base, more or less grouped; spores clear, globoid, 4-5$\mu$. The name refers to the form.

FIGURE 76. CLAVARIA JUNCEA

### Clavária múcida Tiny Clavaria

Cap 1-2 cm. tall, 1-2 mm. wide, white, yellowish or rarely pinkish, smooth, simple, or with a few tooth-like branches, watery-fleshy, cylindric, acute; spores clear, ellipsoid, 5-7 × 3-4$\mu$. The name refers to the habit of growing on decaying wood.

On wood or on the ground; too small to be valuable.

PHYSALACRIA

Distinguished from Clavaria by an inflated head-like cap, borne on a distinct stem. The name refers to the bubble-like cap.

### Physalácria inflàta Bubble Top

FIGURE 77. PHYSALACRIA INFLATA

Cap 4-8 mm. wide, whitish or yellowish, smooth, thin, fleshy-waxy, more or less globose; stem 8-20 mm., slender, white, slightly scaly, solid; spores clear, small, ellipsoid, 4-5 × 2-3$\mu$. The name refers to the swollen head.

## LEATHER FUNGI THELEPHORACEAE

Resembling pore fungi and tooth fungi in the variety of forms and textures, but distinguished from both by the absence of pores or teeth, i. e., the

spore-bearing surface is smooth or merely wrinkled. The texture ranges from more or less fleshy to leathery or woody, though it is usually leathery or papery. The caps are central-stemmed, shelf-like or mere leathery layers. With the exception of the first genus, the forms are too tough to be of value.

### KEY TO THE GENERA


| | | Page |
|---|---|---|
| 1. Cap funnel-shaped, stalked, fleshy | Craterellus | 114 |
| 2. Cap funnel- to fan-shaped, leathery | Thelephora | 115 |
| 3. Cap shelf-like or a mere layer (in our forms) | | |
| a. Cap shelf-like | Stereum | 116 |
| b. Cap a layer | Corticium | 117 |


### CRATERELLUS

Cap funnel-form, more or less fleshy, stalked. The under surface is more or less ridged or wrinkled longitudinally, or in some cases nearly smooth. Closely related to Cantharellus among the gill fungi, but the vein-like gills are very much less distinct or lacking. All our species are edible. The name refers to the funnel-like cap.

#### Key to the Species

| | |
|---|---|
| 1. Stem stuffed; cap yellow or yellowish | *C. cantharellus* |
| 2. Stem hollow | |
| a. Cap brownish black; spores ellipsoid | *C. cornucopioides* |
| b. Cap brownish; spores globoid | *C. dubius* |

#### Craterellus cantharellus Yellow Craterellus

Cap 3-7 cm. wide, yellow or yellowish, or somewhat pinkish, smooth, tough-fleshy, funnel-shaped; stem 2-7 cm. by 6-10 mm., yellow, smooth, solid or stuffed; hymenium more or less ridged or wrinkled, yellow; spores yellowish, ellipsoid, 7-10 × 5-6$\mu$. The name refers to the great resemblance to Cantharellus.

On ground in woods; excellent.

#### Craterellus cornucopioides Horn-of-Plenty

Cap 5-8 cm. wide, gray-soot-color to brownish black, somewhat scaly, tough-fleshy, tuba-shaped; stem 5-8 cm., black or blackish, smooth, hollow, i. e., a tube; hymenium merely uneven; spores clear, ellipsoid, 12-14 × 7-8$\mu$. The name refers to the form.

On the ground, single or clustered, in woods or openings; excellent.

#### Craterellus dubius Brown Craterellus

Cap 2-5 cm. wide, brown or brownish, slightly fibrous, tough-fleshy, tuba-shaped, the margin wavy or lobed; stem 3-6 cm., brown, hollow; hymenium

dark gray, the small faint folds more or less united; spores clear, globoid, 6-8 × 5-6$\mu$. The name of doubtful application.

On the ground in woods; excellent.

### THELEPHORA

Cap funnel-form to fan-shaped or irregular, leathery, the hymenium smooth or slightly wrinkled. A genus of widely different forms, closely related to Craterellus, and to the two following genera as well. The forms are all leathery, and hence not edible. The name refers to the more or less wrinkled hymenium.

FIGURE 78. CRATERELLUS CORNUCOPIOIDES

#### Key to the Species

| | | |
|---|---|---|
| 1. | Cap funnel-form, snow-white | *T. sowerbyi* |
| 2. | Cap fan-shaped, or more or less irregular | |
| a. | Cap narrowly fan-shaped, erect, whitish | *T. schweinitzii* |
| b. | Cap shelf-like, somewhat imbricated, rust-brown | *T. laciniata* |

#### Theléphora sowérbyi Snowy Thelephora

Cap 2-5 cm. tall, snowy white, zoneless, rough with radiating lines, leathery-woody, entire, funnel-form; hymenium smooth; spores irregularly globose, angled, clear, 7-8$\mu$. Named after the English botanist, Sowerby.

In troops or small clusters on the ground in woodland or in openings.

### Theléphora schweinítzii Coral Thelephora

Cap 7-10 cm. tall, clusters 12-15 cm. wide, whitish, the stem-like base branched into many small erect flattened divisions, which are much lobed and divided, the hymenium and stem reddish.

On the ground in woodland or grassland.

### Theléphora laciniáta Torn Thelephora

Caps shelf-like, in clusters 4-5 cm. tall and 6-8 cm. wide, dull rust-brown, more or less fibrous and scaly, the margin fringed, soft-fleshy, more or less imbricated; hymenium roughened; spores darkish, angled-globose or tuberculate, 6-9$\mu$. The name refers to the torn fringed margin.

Densely clustered at the base of stems, etc., or on the wood itself.

FIGURE 79. THELEPHORA LACINIATA

## STEREUM

Closely related to Thelephora, and like it widely variable in form and texture. Our species are shelf-like, resembling the bracket pore fungi, but without the pores. None of the species are edible. The name refers to the hard texture.

### Key to the Species

| | | |
|---|---|---|
| 1. | Cap rust-brown, more or less downy | *S. versicolor* |
| 2. | Cap grayish, shaggy with hairs | *S. hirsutum* |

### Stéreum versícolor Zoned Stereum

Cap shelf-like, 4-8 cm. wide, dull brown or rust-brown, downy or smooth, markedly zoned, the zones more or less variable in color, firm, leathery; hymenium whitish to brown. The name refers to the varying color.

Everywhere on old stumps and logs.

### Stéreum hirsútum Shaggy Stereum

FIGURE 80. STEREUM VERSICOLOR

Cap 3-8 cm. wide, gray or grayish, yellow at the margin, more or less shaggy-hairy, somewhat zoned, firm, leathery; hymenium yellowish or variable; spores clear, oblong, 6-8 × 2-3μ. The name refers to the shaggy cap.

Common on stumps and logs.

#### CORTICIUM

Cap a soft-leathery or waxy layer on wood, often with a distinct downy margin, and then saucer-like. The name refers to the bark-like form and texture of the plant. None are edible.

### Cortícium incarnátum Rosy Corticium

Cap 2-10 cm. wide, often fusing with each other, rosy to reddish, more or less waxy, the surface wavy, then cracked, forming a flat circular or irregular layer; spores ellipsoid, clear, 8-12 × 3-5μ. The name refers to the color.

Common on decaying wood and branches.

FIGURE 81. CORTICIUM INCARNATUM

#### JELLY FUNGI
#### TREMELLACEAE

Cap more or less jelly-like when wet, cartilaginous or horny or waxy when dry. The cap is usually stemless, globose or brain-like or irregular; the fruiting surface is smooth, i. e., it does not show pores or teeth, except in

the one genus, Tremellodon, which will probably be sought among the tooth fungi. Many of the species are edible, though not of great excellence. They occur typically on wood, though one is a parasite on gill fungi. The name refers to the jelly-like nature of the plant.

### KEY TO THE GENERA

| | | Page |
|---|---|---|
| 1. Cap with teeth, fan- or funnel-like | **Tremellodon** | 118 |
| 2. Cap without teeth | | |
| a. Cap blackish brown or black | | |
| (1) Cap large, 5-12 cm. tough, concave or ear-like | **Hirneola** | 118 |
| (2) Cap small, ½-2 cm., soft, globoid to convex | **Exidia** | 119 |
| b. Cap white to yellow or orange, rarely brownish | | |
| (1) Cap globoid to brain-like or branched, jelly-like | | |
| (a) Cap wrinkled, folded or branched, large, 1-12 cm. | **Tremella** | 119 |
| (b) Cap smooth or with small folds, small, 4-9 mm. | **Dacryomyces** | 122 |
| (2) Cap small, erect, flattened, stalked, cartilaginous | **Guepinia** | 122 |

### TREMELLODON

Cap fan-like, or incompletely funnel-form, more or less stalked, soft, jelly-like, the lower or spore-bearing surface consisting of teeth. This fungus will be sought first among the tooth fungi, but its texture and structural characters place it among the jelly fungi. The name refers to the gelatinous texture and the teeth.

#### Tremēllodon gelatinósus Jelly Spine

Cap 2-8 cm. wide, more or less clear, with bluish tinge, roughened with small dots, jelly-like, trembling, usually fan-shaped, somewhat stalked; teeth soft, white; spores globoid, clear, 7-8$\mu$. The name refers to the jelly-like texture.

On decaying wood, autumn and winter: said to be delicious when slowly stewed.

### HIRNEOLA

Cap more or less cup-shaped or ear-like, jelly-like but firm when wet, horny when dry, the hymenium often veined or folded, but without teeth. The name refers to the cup-like form.

### Hirnéola auricula-júdae
### Jew's-ear

Cap 5-8 cm. wide, dark brown to black, the hymenium veined and folded, the outside more or less downy, cup-shaped or ear-like, firm; spores kidney-shaped, 15-20 × 5-9$\mu$. The name refers to the ear-like cap.

On decaying wood; edible.

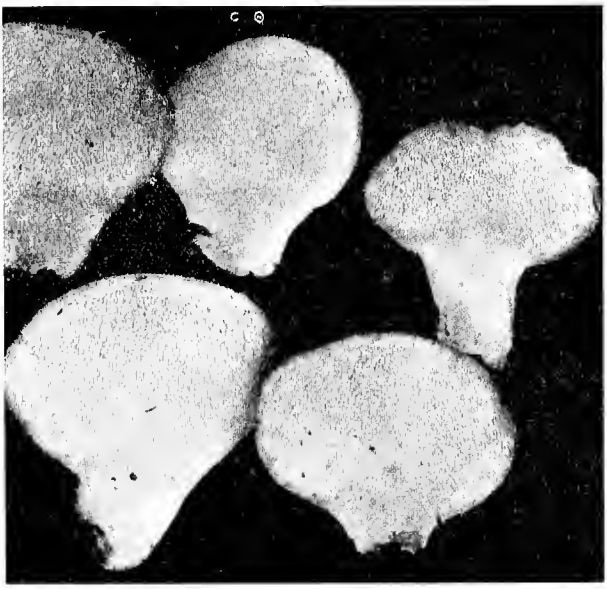

FIGURE 82. TREMELLODON GELATINOSUS

#### EXIDIA

Cap globoid to convex, often spread out, jelly-like, more or less roughened by tiny elevations, somewhat wrinkled or smooth, black. The name refers to its appearance of being exuded from the branch on which it grows.

FIGURE 83. HIRNEOLA AURICULA-JUDAE

### Exídia glandulósa
### Black Jelly

Cap ½-2 cm. wide, black, the surface wrinkled or smooth, dotted with tiny nipples, globoid, convex or spread out, soft, trembling; spores clear, oblong, curved, 12-14 × 4-5$\mu$. The name refers to the tiny nipples.

Common as a black jelly-like layer on branches, of oak, birch, etc., thin and crust-like when dry; too small to be of value.

#### TREMELLA

Cap wrinkled and folded or lobed, more or

FIGURE 84. EXIDIA GLANDULOSA

less nutritious than most mushrooms.

less brain-like or branched, jelly-like, trembling, typically white to yellow or orange, rarely darker. Large forms common on decaying trunks and stumps, conspicuous in wet weather, dry and more or less shrunken and horn-like at other times. All known species are edible, though

## Key to the Species

1. On wood or on leaf mold
   a. Cap white, coral-like — *T. fuciformis*
   b. Cap yellow or yellowish, at least not white
      (1) Cap small, 1-3 cm. wide — *T. lutescens*
      (2) Cap large, 5-15 cm. wide
         (a) Cap orange-yellow, brain-like — *T. mesenterica*
         (b) Cap pink-yellow to purplish, with large leaf-like lobes — *T. frondosa*
2. On gill fungi — *T. mycetophila*

### Tremélla fucifórmis
### Coral Tremella

Cap 10-15 cm. wide, snow white, branched into stout, 2-forked, more or less erect lobes, jelly-like, soft; spores clear, more or less ovoid, 7-9 × 5-6$\mu$. The name refers to the seaweed-like branches.

On leaf mold in woods; edible.

### Tremélla lutéscens
### Buff Tremella

Cap 1-3 cm. wide, yellowish or buff, more or

FIGURE 85. TREMELLA FUCIFORMIS

This is Tremella vesicaria (Lloyd. Letter No. 44 p. 12).

less wrinkled and folded, soft, trembling; spores globose, 12-15$\mu$. The name refers to the color.

In clusters on decaying trunks and branches; too small to be valuable.

### Tremélla mesentérica Orange Tremella

Cap 5-10 cm. wide, bright orange or orange-yellow, very variable, but usually much branched and folded, jelly-like, firm; spores ellipsoid to globoid, 6-8$\mu$. The name refers to the form.

Common on dead trunks and branches; edible.

FIGURE 86. TREMELLA FRONDOSA

### Tremélla frondósa Leafy Tremella

Cap 5-15 cm. wide, yellow, yellowish, or pinkish yellow, rarely brownish, deeply lobed, the lobes large, leaf-like, wrinkled or folded, jelly-like; spores globose, 5-7$\mu$. The name refers to the leaf-like lobes.

Frequent on decaying wood; said to be edible.

### Tremélla mycetóphila Parasitic Tremella

Cap 1-10 cm. wide, yellowish to whitish, more or less plate-like, with circular folds, jelly-fleshy, somewhat powdered; spores clear, globose, 2-3$\mu$.

Parasitic on the caps and stems of mushrooms, Collybia dryophila and Marasmius oreades; edible.

#### DACRYOMYCES

Cap globoid to convex, somewhat folded or smooth, jelly-like, small. On wood. The name means tear fungus.

FIGURE 87. GUEPINIA SPATHULATA

### Dacryómyces stillátus Orange Tear

Cap 2-9 mm. wide, yellow or orange, jelly-like, globoid or convex, more or less folded; spores clear, more or less curved, with cross walls, 18-30 $\times$ 8-12$\mu$. The name means drop-like.

Common on decaying wood, clustered or in groups; too small to be of value.

#### GUEPINIA

Cap more or less spatula-like and stalked, cartilaginous rather than jelly-like, shrinking little on drying. Named for the botanist Guepin.

### Guepínia spathuláta Coral Spatula

Cap 1-3 cm. tall, pale yellow, yellow or orange, spatula-shaped, lobed or branched, and somewhat ridged above, with a narrow stem-like base, cartilaginous or horny. The name refers to the form.

Common on wood, especially railway ties, usually clustered or in troops; too small and tough to be of value.

## PUFFBALLS LYCOPERDACEAE

Cap a closed ball, with or without a stem, breaking or opening at maturity to expose the powdery mass of spores. In most of the genera, the cap is enclosed in two walls or membranes, the outer of which may split into star-like lobes or circularly, or may fall away in fragments. The flesh is white when the plant first appears, but as the spores mature, it becomes stained with yellow, and finally turns into a powdery mass of spores and threads, which escape through mere cracks or through a definite opening. In the young condition, practically all puffballs are edible, and many of them delicious. One or two only are suspected. They grow habitually on the ground, though a few occur on wood.

### KEY TO THE GENERA


| | | Page |
|---|---|---|
| 1. Cap traversed by a distinct stem, at least when young | **Secotium** | 123 |
| 2. Cap not traversed by a stem, pulp uniform or nearly so | | |
| a. Outer wall splitting circularly, or into star-like lobes | | |
| (1) Wall splitting circularly, half or less remaining on the cap | **Catastoma** | 124 |
| (2) Wall splitting into starlike lobes | **Geaster** | 124 |
| b. Outer wall breaking away in pieces or wearing off | **Tylostoma** | 126 |
| (1) Cap with a slender distinct stalk | | |
| (2) Cap stalkless, or the broad stalk widening into the cap | | |
| (a) Inner wall breaking into pieces, freeing the spores; cap often very large | **Calvatia** | 127 |
| (b) Inner wall opening by a distinct mouth or a more or less regular tear at the apex; cap small to medium | | |
| x. Cap with a stalk-like base; opening by a distinct mouth | **Lycoperdon** | 128 |
| y. Cap without a stalk-like base, opening by a tear | **Bovista** | 130 |


### SECOTIUM

Cap globoid to conic, with a short stalk, which is continued through the pulp to the apex, distinguishing this genus from all the following. The cap breaks at the base about the stem. The presence of the stem in the cap connects this genus with the gill fungi. The pulp contains more or less evident hollows, at least when young. The name refers to the presence of hollows in the pulp.

### Secótium acuminátum Cap Stalk

Cap 3-6 cm. tall, 2-4 cm. wide, ovoid to more or less conic, tan to ocher, scaly, more or less folded about the short stalk, where it opens; stem 1-2 cm. long, more or less bulbous: spores yellowish to olive, globose, smooth, 5-8$\mu$. The name refers to the conic cap.

On the ground in grassland or woodland; suspected of being poisonous.

## CATASTOMA

Cap globose to flattened, more or less imbedded in the soil, stemless. At maturity the outer wall breaks around the middle, leaving the lower half in the ground and the upper half clinging to the cap. The mouth is at the apex of the

FIGURE 88. CATASTOMA CIRCUMSCISSUM

inner wall, and is thus downward while the plant is in the original position. The name refers to the habit of the plant by which the mouth becomes turned upward at maturity.

### Catástoma circumscíssum Somersault Cap

Cap 1-2 cm. wide, globose, somewhat flattened, the inner wall whitish or gray, finely scaly, with a small regular mouth; spores yellowish, globose, spiny or warted, 4-5$\mu$. The name refers to the circular splitting of the outer wall.

On the ground along paths, or in grassland; edibility not tested.

## GEASTER

Cap more or less globose, with a leathery outer wall, which splits radiately, forming a star-like base, upon which the inner wall sits. The mouth is definite, and often beautifully folded or fringed. All our species are probably edible, if collected when young. The name refers to the star-like base.

## Key to the Species

1. Inner wall with a volva- or cup-like membrane at base — *G. triplex*
2. No cup-like membrane between the inner and outer wall
   a. Mouth a more or less irregularly torn hole — *G. hygrometricus*
   b. Mouth definite, fringed or furrowed
      (1) Mouth fringed, not furrowed — *G. limbatus*
      (2) Mouth radiately furrowed — *G. striatus*

FIGURE 89. GEASTER TRIPLEX

### Geáster tríplex Collar Earthstar

Cap 2-3 cm. wide, the outer wall fleshy at first, splitting into two parts, the lower forming a star-like base with 5-7 lobes, the upper a collar or cup below the inner wall, the latter papery, dark brown, with a conical fringed mouth; spores brownish, globose, rough, 2-4$\mu$. The name refers to the three membranes.

On the ground in woodland or grassland; probably edible when young but not tested.

### Geáster hygrométricus Roll Earthstar

Cap 5-8 cm. wide, the outer wall fleshy-woody, splitting usually into 7-20 lobes, the lobes with a waxy darkish inner face, strongly inrolled when dry, expanded when moist; the inner wall papery or leathery, gray to brown, the mouth more or less irregularly or stellately torn; spores red-brown, globose, rough, 7-10$\mu$. The name refers to the effect of moisture in unrolling the lobes.

Common on the ground in grassland and woodland; edible when young.

### Geáster limbátus Bordered Geaster

Cap 2-3 cm. wide, outer wall splitting into 6-10 lobes, with brownish faces; inner wall on a short broad stalk, the mouth low-conic, in a paler circle, fringed; spores brownish, globose, rough, 3-4$\mu$. The name probably refers to the circle about the mouth.

Common on the ground in woodland: not tested.

FIGURE 90. TYLOSTOMA MAMMOSUM
(Tylostoma campestris. Lloyd. Letter No. 44 p. 12)

### Geáster striátus Striate Geaster

Cap 1-3 cm. wide, the outer wall split into 5-8 lobes; inner wall brownish, the mouth tall-conic, radiately furrowed; spores darkish, globose, rough, 3-5$\mu$. The name refers to the mouth.

Common on the ground in woodland or grassland; not tested.

## TYLOSTOMA

Cap more or less globose, on a distinct cylindric stem; outer wall disappearing early. The mouth is round and definite in our species. Found on the ground, especially in sandy soil; edibility not tested, but scarcely of importance. The name refers to the cartilage-like mouth of some species.

### Tylóstoma mammósum Stalk Puffball

Cap 7-12 mm. wide, whitish to brownish, the outer wall powdery and disappearing early, mouth round, small, raised; stem 3-10 cm. by 2-4 mm., whitish,

cylindric, hollow or with a central core; spores globose, rust-colored, 4-5$\mu$. The name refers to the raised mouth.

Frequent in sandy fields; edibility not known.

### CALVATIA

This genus is distinguished from Lycoperdon and Bovista by the lack of a mouth or opening, through which the spores escape. The inner wall breaks away in fragments, leaving in most species a sterile, stalk-like base. This genus contains the largest and best of our puffballs. All the species are found on the ground, often in fairy rings, and all are edible. The name refers to the smooth wall.

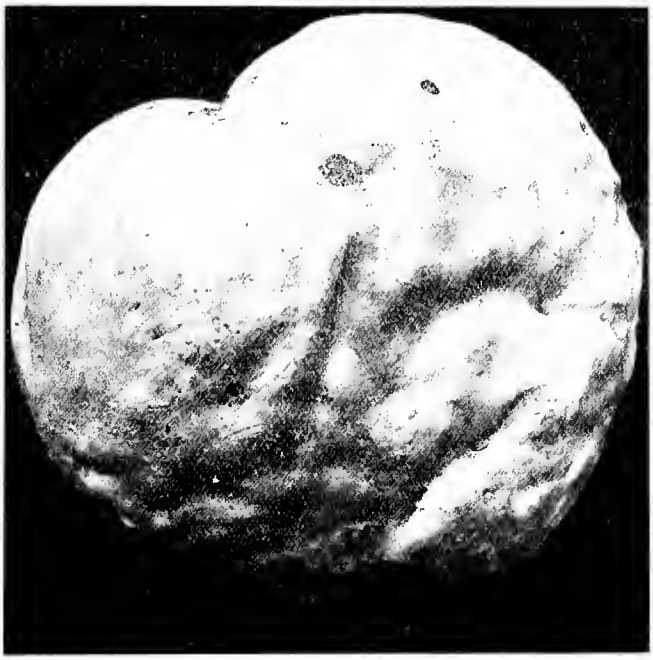

FIGURE 91. CALVATIA GIGANTEA

#### Key to the Species

| | |
|---|---|
| 1. Cap very large, without a stalk-like base | *C. gigantea* |
| 2. Cap large, with a stalk-like base | |
| a. Spore mass brown or olive-brown | *C. caelata* |
| b. Spore mass lilac- or purple-brown | *C. cyathiformis* |

#### Calvátia gigantéa Giant Puffball

Cap very large, 25-50 cm. wide, white or whitish, yellowish or brownish in age, smooth, or somewhat roughened by scales or cracks, more or less globose; spores olive or olive-brown, globose, smooth, 4$\mu$. The name refers to the great size.

Common among grasses or herbs, late summer and autumn; one of the best of edible fungi.

### Calvátia caeláta Carved Puffball

Cap large, 8-20 cm. wide, whitish to yellowish and brownish, the outer wall breaking into large areas or scales which are more or less persistent on the inner wall, broadly top-shaped, with a stout stalk-like base; spores olive-brown, globose, smooth, 4-5$\mu$. The name refers to the large scales and areas.

On the ground in grassland, summer and autumn; excellent.

### Calvátia cyathifórmis Cup Puffball

Cap large, 8-20 cm. wide, whitish to grayish or brownish, smooth or somewhat scaly or cracked into areas, more or less globose, with a short thick base; spores purple-brown, globose, rough, 5-7$\mu$. The name refers to the sterile base, which remains as a cup-like stalk after the mass of spores has blown away.

On the ground in grassland, summer and autumn; excellent.

## LYCOPERDON

Cap with a stem-like base, a scaly or spiny outer wall, and a distinct mouth. It is separated by the base from Bovista, and by the definite mouth from Calvatia. The species are common, usually on ground in woodland, sometimes on wood itself. They are edible when young, so far as is known. The name refers to the mass of spores.

### Key to the Species

| | | |
|---|---|---|
| 1. | Outer wall of very long white spines | *L. pulcherrimum* |
| 2. | Outer wall of small short spines, or scales | |
| a. | On the ground, rarely on wood | *L. gemmatum* |
| b. | On wood | *L. pyriforme* |

### Lycopérdon pulchérrimum Spiny Lycoperdon

Cap 3-8 cm. wide, outer wall of long white spines, which are united at the tips, these fall away, leaving the brownish inner wall, more or less top-shaped, with a short thick base; spores purple-brown, globose, rough 4-6$\mu$. The name refers to the beautifully spiny surface.

On the ground in grassland and woodland, late summer and autumn; edible.

### Lycopérdon gemmátum
### Gem Puffball

Cap 2-5 cm. wide, outer wall of longer spines circled by short wart-like ones, the longer falling away and leaving a net-like surface, white to gray, then yellowish brown, more or less top-shaped; spores brown or olive-brown, globose, smooth or finely roughened, 3-5$\mu$. The name refers to the beautifully netted surface.

Common on the ground in woods, summer and autumn; excellent, but as with all puffballs care must be taken to exclude all plants in which the pulp has begun to turn yellow.

FIGURE 92. LYCOPERDON PULCHERRIMUM

### Lycopérdon pyrifórme
### Stump Puffball

Cap 2-5 cm. wide, outer wall of tiny spines or warts, whitish to brownish, top-shaped, with a short base; spores olive-brown, globose, smooth, 4$\mu$. The name refers to the form.

Common on stumps and logs in the woods, summer and autumn, usually in dense clusters; edible when young.

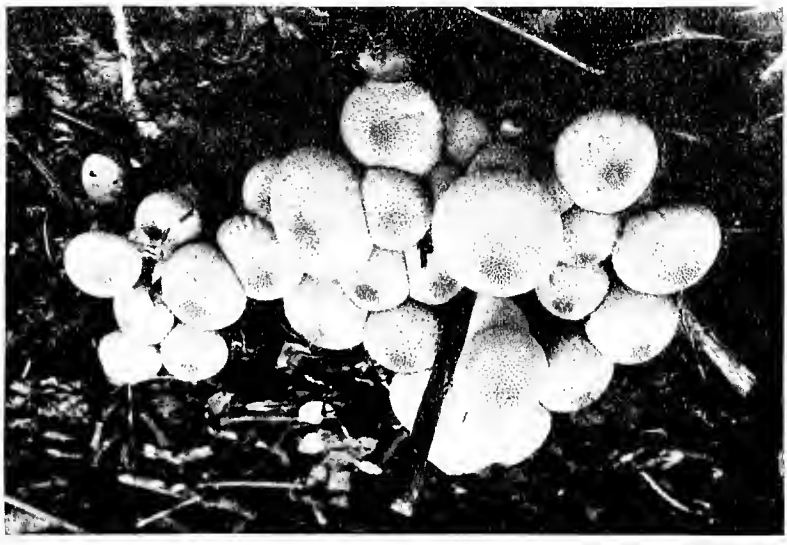

FIGURE 93. LYCOPERDON GEMMATUM

## BOVISTA

Cap more or less globoid, but without a sterile base or a definite mouth, in which respects it differs from Lycoperdon. The outer layer is fragile and papery, soon disappearing. The species are small, grow on the ground and are edible. Name doubtful.

### Key to the Species

1. Cap 2-3 cm. wide, lead-colored — *B. plumbea*
2. Cap 3-6 cm. wide, brown — *B. pila*

FIGURE 94. LYCOPERDON PYRIFORME

### Bovísta plúmbea Lead Bovista

Cap 2-3 cm. wide, cortex white and papery, finally disappearing, showing the smooth lead-colored inner wall with an irregular mouth, more or less globose; spores brown-purple, ovoid, smooth, 6-7 × 5-6$\mu$. The name refers to the color.

On the ground in grassland, spring to frost; edible.

### Bovísta píla Brown Bovista

Cap 3-6 cm. wide, cortex white and papery, breaking up into scales which drop off, showing the brown or brown-purple inner wall, with an irregular torn opening, more or less globoid; spores purple-brown, globose, smooth, 4-5$\mu$. The name refers to the ball-like cap.

On the ground in woodland and grassland, spring to autumn; edible.

## CARRION FUNGI PHALLACEAE

These resemble puffballs when young, but as they mature the outer wall is ruptured by the lengthening stem. The spores are exposed on the top of the stem as a gelatinous mass, to which flies are drawn by the odor of the plant. The carrion or "stink-horn" fungi resemble morels to some extent, but are readily distinguished by the odor, the cup at the base of the stem and by the gelatinous spore-mass. According to McIlvaine, several species are edible when young, but the beginner will not be attracted by them.

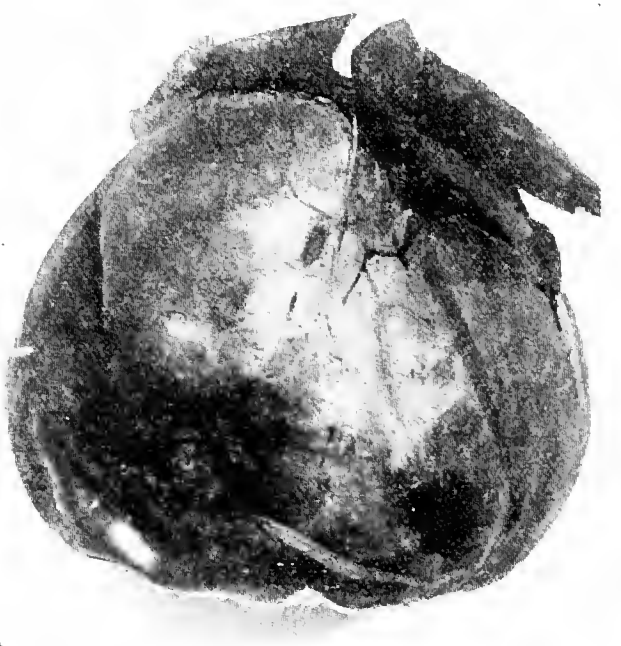

FIGURE 95. BOVISTA PILA

### KEY TO THE GENERA

| | | Page |
|---|---|---|
| 1. Receptacle cap-like | | |
| a. Stalk with a net-like appendage below the cap | **Dictyophora** | 131 |
| b. Stalk without a net-like appendage | **Ithyphallus** | 132 |
| 2. Receptacle not cap-like, much like the stalk but red | **Mutinus** | 133 |

### DICTYOPHORA

Receptacle cap-like, stalked, the latter with a volva-like cup at the base. The genus is distinguished from Ithyphallus by the appendage or veil, which is hidden under the cap in the second species. Both species are said to be edible when young. The name refers to the presence of the net.

## Key to the Species

1. Net large, perforated — *D. duplicata*
2. Net small, not perforated, concealed beneath the cap — *D. ravenelii*

### Dictyóphora duplicáta Net Stem

Receptacle 3-5 cm. tall, conic to bell-shaped, more or less netted, with a thick white, 3-5-divided volva at the base of the stem, the latter more or less cylindric, 12-20 cm. tall, spongy, with a netted perforate veil or appendage which hangs down as far as the volva, white; spores elliptic, $4 \times 2\mu$. The name refers to the presence of the veil.

FIGURE 96. DICTYOPHORA RAVENELII

On the ground in woods and clearings, summer and autumn; edible when very young.

### Dictyóphora ravenélii

Receptacle 2-4 cm. tall, conic to bell-shaped, smooth, with a pinkish 2-3-divided volva at the base of the stem, the latter cylindric, 10-15 cm., white, spongy, the veil hidden beneath the cap; spores elliptic, $4 \times 2\mu$. Named for the botanist, Ravenel.

On the ground, summer and autumn; edible when young.

### ITHYPHALLUS

Distinguished from Dictyophora by the entire absence of a veil, but similar to it in practically all other respects.

### Ithyphállus impudícus
### Stink-horn Fungus

Receptacle 4-5 cm. tall, conic to bell-shaped, more or less netted and pitted; stem cylindric, spongy, 12-20 cm. tall, volva pinkish, globose, 2-3-divided; spores elliptic, $4 \times 2\mu$.

On the ground, woodland, grassland, yards, etc., summer and autumn; edible when young.

### MUTINUS

Distinguished by the receptacle seeming but a continuation of the stem, and hence not cap-like. The stem also lacks a veil.

### Mutínus canínus

Receptacle 2-3 cm. tall, wrinkled, red; stem cylindric, tapering, white or reddish, 7-10 cm.; volva more or less sheathing, torn at the top; spores elliptic, 6 × 4$\mu$.

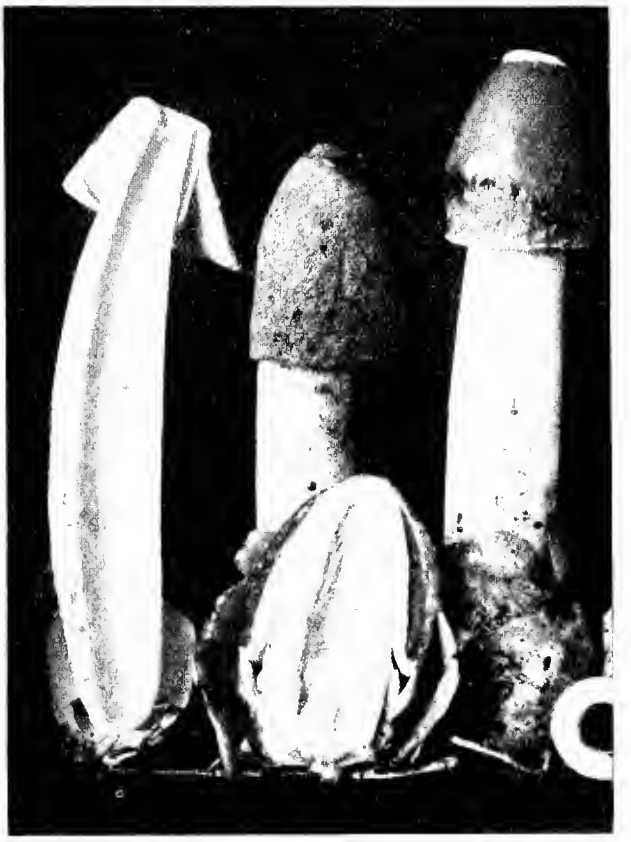

FIGURE 97. ITHYPHALLUS IMPUDICUS

Same as Fig. 96. (Lloyd. Letter No. 44, p. 12)

On the ground in woodland and clearings, summer and autumn; edible when young, i. e., in the "egg" stage.

## BIRD'S NEST FUNGI NIDULARIACEAE

Cup-shaped fungi at first covered by a membrane, which ruptures, disclosing the small seed-like spore-bearing bodies. Small fungi of clustered habit; not edible owing to the leathery texture.

KEY TO THE GENERA


| | | Page |
|---|---|---|
| 1. Cup inverted conic, 10-16 mm. tall | Cyathus | 134 |
| 2. Cup cup-shaped, 5-8 mm. tall | Crucibulum | 135 |

FIGURE 98. MUTINUS CANINUS

## CYATHUS

Readily distinguished from Crucibulum by microscopic characters of the wall and sporangiole, but to be told by the beginner chiefly through its form and size. The name means cup-like.

### Key to the Species

| | |
|---|---|
| 1. Margin of the cup grooved or striate | *C. striatus* |
| 2. Margin of cup not striate | *C. vernicosus* |

FIGURE 99. CYATHUS VERNICOSUS

### Cyáthus striátus Grooved Cyathus

Cup 10-16 mm. tall, 8-10 mm. wide, outside yellowish to rust-colored, smooth or hairy, inside grooved at margin, lead-colored, shining, inverted conic; spore-bodies white; spores elliptic, clear, 17-18 × 9-11$\mu$. The name refers to the grooved margin.

On decaying wood, straw, etc., and on the ground, everywhere; not edible.

### Cyáthus vernicósus Shining Cyathus

Cap 10-15 mm. tall, 8-10 mm. wide, outside grayish, yellowish or brownish, hairy or smooth, inside smooth, shining, leaden or brown, inverted conic; spore-bodies gray; spores clear, ovoid, 12-14 × 6-8$\mu$. The name refers to the polished inner surface.

Common on wood and ground, everywhere; not edible.

#### CRUCIBULUM

Distinguished by the smaller size, bell-shape, and the bright yellow hairy membrane and coating when young. The name refers to the cup-like form.

### Crucíbulum vulgáre Common Crucibulum

Cup 5-8 cm. tall, 6-7 cm. wide, yellow to rust-colored, hairy or smooth, yellowish and shining within, bell-shaped; spore-bodies white; spores elliptic, clear, 8-9 × 4-5$\mu$. The name refers to the frequence.

Common on wood, stems, etc.; not edible.

## SADDLE FUNGI HELVELLACEAE

Distinguished from all the preceding families by the presence of sacs or asci in which the spores are borne. The forms are all stemmed and some resemble the club-shaped Clavarias more or less closely. As a rule the spore-bearing part, which is a more or less modified cup, is ridged, saddle-like or head-like, and distinct from the stem. In the one genus where this is not the case, the black color is distinctive. As a rule, the genera of this family are edible.

#### KEY TO THE GENERA

| | | Page |
|---|---|---|
| 1. Plant club-shaped, black; stem and cup not distinct | **Gleoglossum** | 136 |
| 2. Plant with the cap and stem clearly distinct | | |
| a. Cap usually united with stem, ridged in both directions | **Morchella** | 136 |
| b. Cap free from stem, or at least not ridged if united with it | | |
| (1) Cap free from stem, rarely ribbed lengthwise | | |
| (a) Cap saddle-like, more or less lobed | **Helvella** | 139 |
| (b) Cap globose, more or less folded | **Gyromitra** | 141 |

| | | Page |
|---|---|---|
| c Cap more or less conic or bell-shaped, smooth or ridged | Verpa | 138 |
| 2 Cap distinct from the stem, but united with it, head-like or crest-like | | |
| a Cap head-like | | |
| x. Cap gelatinous | Leotia | 142 |
| y. Cap fleshy or waxy | Cudonia | 143 |
| b Cap club-shaped or wedge-shaped | Spathularia | 144 |

FIGURE 100. GEOGLOSSUM HIRSUTUM

GEOGLOSSUM

### Geoglóssum hirsútum Black Tongue

Cap 2-3 cm. tall, 1-2 cm. wide, black, more or less wrinkled, hairy, club-shaped; stem 6-8 cm., cylindric, black, solid, hairy; spores brown, very long, many-celled, 100-120 × 4-7$\mu$.

On the ground; not edible.

MORCHELLA

The cap is more or less deeply ridged crosswise and lengthwise, and is joined firmly to the stem at the base as a rule. The plants are fleshy, of a delightful odor, and the choicest of all mushrooms. The name is the classic name of the morel.

## Key to the Species

1. Base of cap united with stem
   a. Ridges acute at edge — *M. crassipes*
   b. Ridges obtuse at edge — *M. esculenta*
2. Base of cap not united with stem — *M. hybrida*

### Morchélla crássipes Broadstem Morel

Cap 4-10 cm. tall, 3-6 cm. wide at base, tan to tan-brown, pits deep, the ribs wavy and irregular, with an acute edge, more or less conic; stem 3-12 cm. by 2-6 cm., white or whitish, more or less furrowed and roughened, hollow; spores clear, elliptic, smooth, 20-22 × 10-12$\mu$. The name refers to the broad stem.

On the ground in woods or openings; delicious.

FIGURE 101. MORCHELLA CRASSIPES

### Morchélla esculénta Common Morel

Cap 3-7 cm. tall, 2-4 cm. wide, yellowish brown to brown, pits more or less deep, ribs often very regular, with a blunt edge, more or less conical; stem 2-6 cm. by 1-2 cm., white, smooth or somewhat grainy, hollow; spores clear, smooth, elliptic, 14-22 × 8-14$\mu$. The name refers to the fame of the plant as an edible fungus.

Common on the ground in woods and openings; one of the most delicious of all the mushrooms.

### Morchélla hýbrida Cap morel

Cap 2-3 cm. tall, 2-4 cm. wide, tan or brownish, free from the stem except at top, the ribs mostly longitudinal, making long pits or grooves, pointed bell-shaped or broadly conic; stem 3-10 cm. by 2-3 cm., white or whitish, grainy, bulbous at the base, hollow; spores clear, elliptic, smooth, 18-20 × 10-14$\mu$. The name refers to the resemblance to Verpa. This species belongs almost equally well in Verpa.

On ground in woodland or grassland: delicious.

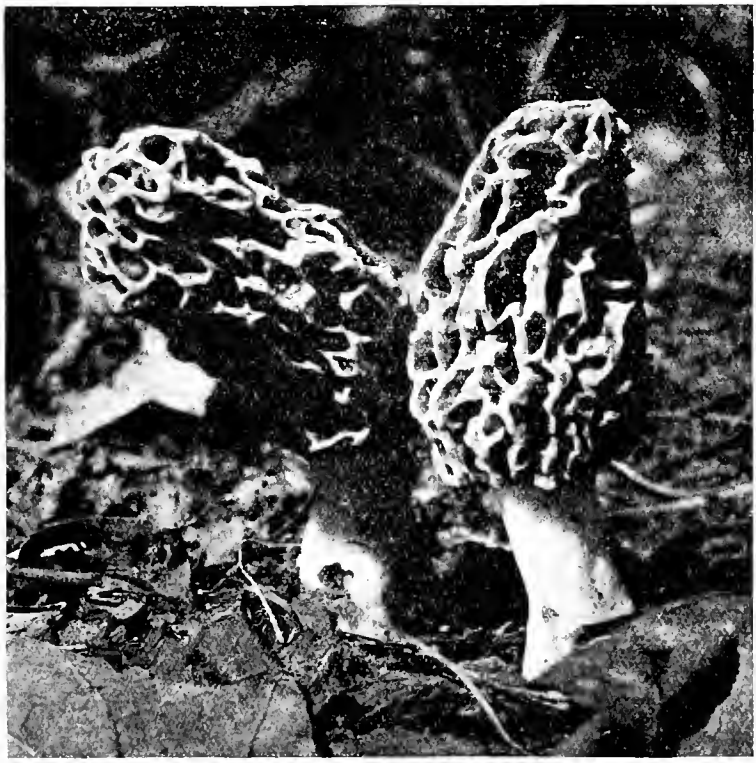

FIGURE 102. MORCHELLA ESCULENTA

VERPA

The cap is smooth or ridged longitudinally, and is free from the stem except at the apex. This genus is very closely related to Morchella, and one species, Morchella hybrida, belongs equally well in Verpa, where the beginner will probably seek it. This genus is of almost as great value as Morchella.

### Key to the Species

1. Cap ribbed — *V. bohemica*
2. Cap smooth
   a. Stem 2-5 cm. tall, yellowish or yellow — *V. conica*
   b. Stem 5-10 cm. tall, more or less darkish or brownish — *V. digitaliformis*

### Vérpa bohémica Ribbed Verpa

Cap 2-4 cm. tall, 1-3 cm. wide, brownish to brown, ribbed lengthwise, with few or no cross ribs, bell-shaped or blunt conic; stem 4-7 cm. by 1-1½ cm., white, smooth, tufted-hairy, stuffed or hollow; spores clear, elliptic, smooth, two in an ascus, 40-60 × 16-18$\mu$. The name is geographical.

On moist ground in woodland and grassland; delicious.

### Vérpa cónica Smooth Verpa

Cap ½-2 cm. wide, ½-1½ cm. tall, brownish or brown, smooth or slightly wrinkled, not ribbed, bell-shaped, rarely conic; stem 2-6 cm. by 3-8 mm., white, smooth or wrinkled, somewhat tufted-hairy, hollow; spores clear, smooth, elliptic, 20-22 × 10-14$\mu$. The name refers to the shape of the cap.

On moist grounds in woods and thickets; delicious.

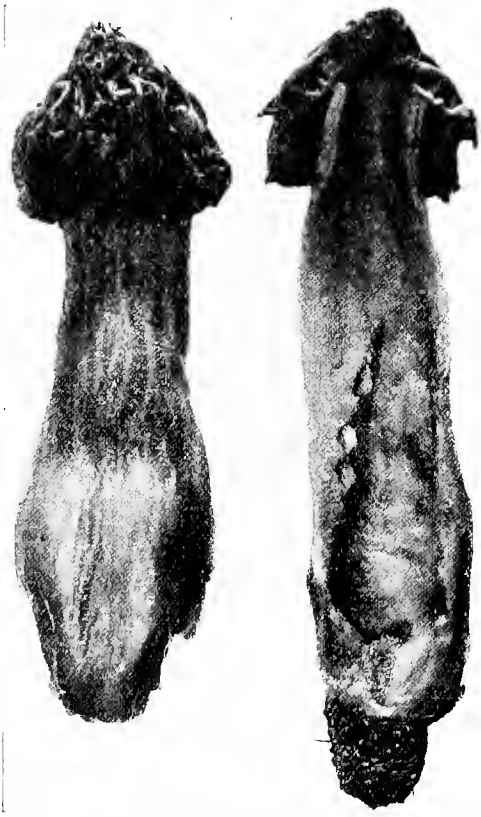

FIGURE 103. MORCHELLA HYBRIDA

FIGURE 104. VERPA BOHEMICA

### Vérpa digitalifórmis Finger Verpa

Cap 1-2 cm. tall and wide, brown or dark brown, smooth, bell-shaped; stem 4-10 cm. by 1-2 cm., yellowish-brown or darkish when mature, smooth, hollow; spores clear, elliptic, smooth, 24 × 12$\mu$. The name refers to the long finger-like stem.

On the ground in woods; delicious.

## HELVELLA

The cap is free from the stem as in Verpa, but it is saddle-shaped and more or less lobed, in place of bell-shaped or conic. The stem is often ribbed. In Gyromitra, the cap loses the saddle shape, and is more or less swollen and folded. The species are found on the ground. They are all edible so far as tested. The name refers to the esculent properties.

FIGURE 105. VERPA CONICA

FIGURE 106.
VERPA DIGITALIFORMIS

## Key to the Species

1. Stem ribbed or grooved
   a. Stem slender, gray to black; cap little wrinkled, dark *H. lacunosa*
   b. Stem stout, white or whitish; cap much wrinkled, white *H. crispa*
2. Stem smooth, elastic *H. elastica*

### Helvélla lacunósa Dark Helvella

Cap 2-4 cm. wide, 1-3 cm. tall, dark gray to blackish or almost black, with a few wrinkles at the center, saddle-shaped, 3-4-lobed; stem 3-6 cm. by 7-15 mm., gray to black, prominently ribbed and grooved lengthwise, hollow; spores clear, elliptic, smooth, 16-18 × 9-12$\mu$. The name refers to the grooved stem.

On the ground in woods; edible.

### Helvélla críspa White Helvella

Cap 3-6 cm. wide, 2-4 cm. tall, white or whitish, much wrinkled, especially toward the middle, margin more or less torn, irregular, hardly saddle-shaped; stem 6-8 cm. by 2-3 cm., white or whitish, to grayish, deeply ribbed and hollowed, hollow; spores clear, elliptic, smooth, 10-16 × 8-10$\mu$. The name refers to the curled cap.

On the ground in woods; edible.

FIGURE 107. HELVELLA LACUNOSA

### Helvélla elástica
### Tough Helvella

Cap 1-4 cm. wide and high, grayish to brownish or blackish, not wrinkled, usually two-lobed and saddle-shaped, but often irregular; stem 3-6 cm. by 4-6 mm., whitish or grayish, not ribbed, slender, tough, hollow; spores clear, elliptic, smooth, 16-20 × 10-12$\mu$. The name refers to the elastic stem.

Common on the ground in woods, usually in troops; edible, but the stems should be removed, or cooked separately for a longer time.

#### GYROMITRA

Much like Helvella, but the cap more irregular, scarcely saddle-shaped, more or less inflated and folded, and the edge united in places with the stem. One species of the genus, G. infula, has been placed in both genera. Gyromitra esculenta is reputed to

FIGURE 108. HELVELLA CRISPA

disagree seriously with some people: McIlvaine has found it enjoyable, however. The name refers to the folded cap.

FIGURE 109. HELVELLA ELASTICA

### Gyromítra ínfula

Cap 4-10 cm. wide and high, yellow brown to dark brown or chestnut, occasionally saddle-shaped, but usually irregular, much folded and swollen, with the edge attached to the stem; stem 3-7 cm. by 1-3 cm., yellowish or pinkish, hairy at base, hollow; spores clear, elliptic, smooth, 18-24 × 8-12$\mu$. The name refers to the folded cap.

On the ground in woods; edible. This species grades on one hand into G. brunnea (Figure 111) and on the other into G. esculenta, in such fashion that it is almost impossible for the beginner to distinguish them.

### LEOTIA

Distinguished by the gelatinous, yellowish or greenish head-like cap. The latter is broader than the stem and distinct from it, but is united to it around the edge. The name refers to the smooth cap.

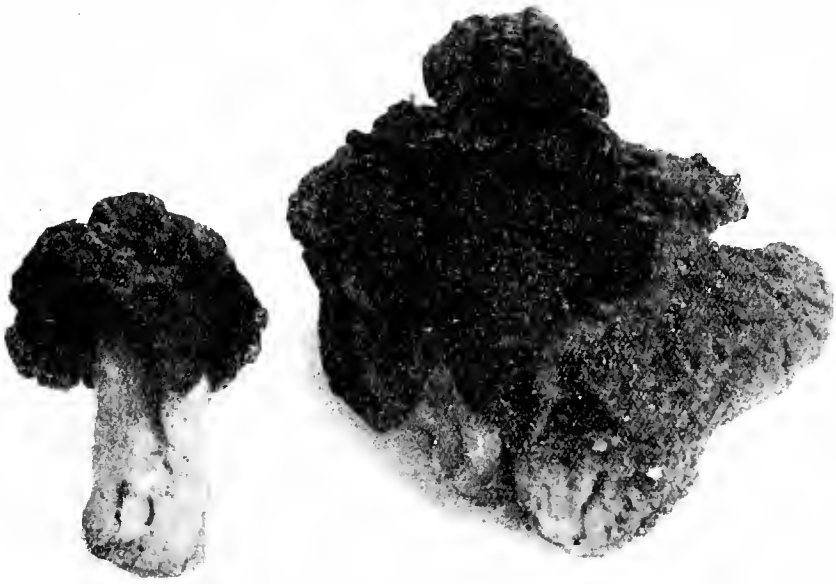

FIGURE 110. GYROMITRA INFULA

### Leótia lúbrica

Cap 5-15 mm., wide, 5-10 mm. tall, yellow to yellowish green or dark green, smooth but often folded and wavy at the margin, gelatinous, inflated, hemispheric; stem 1-6 cm. by 3-8 mm., yellowish to greenish, powdered, hollow; spores clear or greenish, oblong, 2-4-celled, 18-22 × 4-5$\mu$. The name refers to the slimy texture.

On the ground in woods, often on sandy soil; not tested.

FIGURE 111. GYROMITRA BRUNNEA

#### CUDONIA

Resembling Leotia, but the cap fleshy, with the margin free from the stem but rolled inward. The cap is more or less globose. The name refers to the head-like cap.

FIGURE 112. LEOTIA LUBRICA

### Cudónia círcinans

Cap 5-20 mm. wide, tan or yellowish, fleshy, sticky when wet, convex above, somewhat wavy, the margin not united with the stem, turned in, not loose, flattened-globose; stem 2-5 cm. by 4-7 mm., like the cap in color but usually darker, powdered, hollow or solid; spores clear, linear, many-celled, 35-50 × 2$\mu$. The name refers to the incurved margin.

On the ground in woods, usually in clusters or troops; too small to be of importance, but doubtless edible.

FIGURE 113. CUDONIA CIRCINANS

SPATHULARIA

Distinguished from Leotia and Cudonia by the spatula-like cap, which extends down the two sides of the stem. The name refers to the shape of the plant.

### Spathulária claváta

Cap 2-4 cm. tall by 1-3 cm. wide, yellow or yellowish, more or less fleshy, wavy at the margin, the surface somewhat wrinkled, the cap much flattened and extending down the opposite sides of the stem; spores clear, linear, grouped, 60-70 × 2-3$\mu$. The name refers to the form.

On the ground in woods, usually in groups; edible.

## CUP FUNGI PEZIZACEAE

Distinguished by the cup-shaped or saucer-shaped cap from the preceding family, with which it agrees in having the spores borne in sacs. The family is a large one, but relatively few genera have species of sufficient size to make them readily observed. Most of the large forms, if not all of them, are edible, but they are scarcely large enough to be of importance.

### KEY TO THE GENERA


| | | Page |
|---|---|---|
| 1. Cup with a distinct stem | | |
| a. On wood | | |
| (1) Cup bright-colored, red | Sarcoscypha | 145 |
| (2) Cup dark, dark brown to black | Urnula | 145 |
| b. On the ground | | |
| (1) Stem stout, grooved | Acetabula | 146 |
| (2) Stem slender, not grooved | | |
| (a) Cups usually several or many from a black sclerotium | Sclerotinia | 147 |
| (b) Cups single, without a sclerotium | Macropodia | 147 |
| 2. Cup without a distinct stem | | |
| a. Cup large, smooth or roughened, brown to orange | Peziza | 148 |
| b. Cup small, hairy, gray or red | Lachnea | 149 |

SARCOSCYPHA

### Key to the Species

1. Cup 2-4 cm., not shaggy
*S. coccinea*
2. Cup 4-10 mm., shaggy
*S. floccosa*

### Sarcoscýpha coccínea Red Cup

Cup 2-4 cm. wide, the disk scarlet, the outside with a white down, more or less cup-shaped or irregular; stem short, 12-25 mm., rarely lacking, white-downy; spores ellipsoid, 24-30 × 10$\mu$. The name refers to the scarlet fruiting disk.

On decaying twigs and branches, in woodland, March to June; edible.

FIGURE 114. SPATHULARIA CLAVATA

### Sarcoscýpha floccósa Fringe Cup

Cup 4-10 mm. wide, disk scarlet, outside densely covered with long white hairs forming a fringe at the margin, which is more or less incurved, goblet-shaped, tapering downward into the slender white hairy stem; stem 1-3 cm. by 2-3 mm.; spores clear, elliptic, 20 × 11$\mu$. The name refers to the shaggy fringed cup.

FIGURE 115. SARCOSCYPHA COCCINEA

On decaying twigs, rarely on the ground, from spring to autumn; probably edible but too small to be important.

URNULA

### Urnúla cratérium Black Urn

Cup 3-7 cm. wide, dark brown to black, scaly or hairy on the outside, the margin torn and lobed, more or less incurved, irregularly hemispheric to urn-

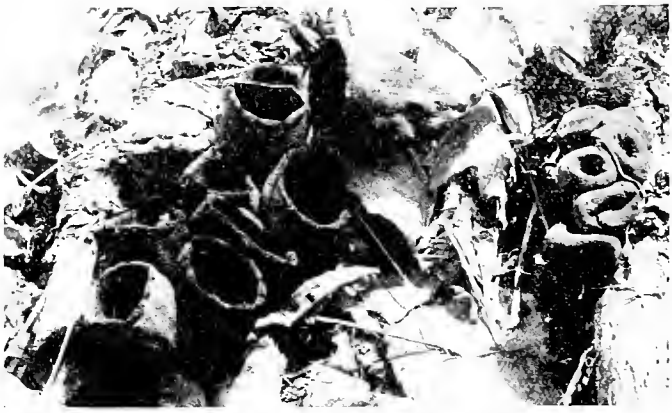

FIGURE 116. URNULA CRATERIUM

shaped; stem stout, 1-5 cm. by 4-8 cm., black, hairy, more or less grooved; spores clear, oblong, 25-30 × 10-12$\mu$. The name refers to the shape of the cup.

ACETABULA

### Acetábula vulgáris

Cup 2-5 cm. wide, 2-4 cm. high, disk dark brown, paler brown outside and more or less scaly or scurfy, roughened by the ridges, cup-shaped, somewhat torn or lobed at the margin; stem 1-2 cm. tall and thick, pale brown, ribbed lengthwise,

FIGURE 117. ACETABULA VULGARIS

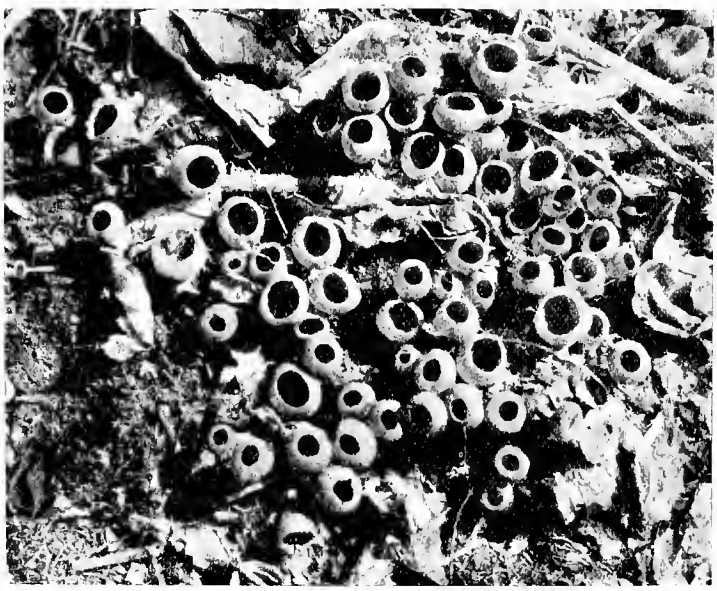

FIGURE 118. SCLEROTINIA TUBEROSA

the ribs often uniting, running some distance up the cup; spores clear, ellipsoid, 12-15 × 9-10$\mu$. The name refers to the occurrence.

On the ground in woods, the stem often buried; said to be edible.

SCLEROTINIA

### Sclerotínia tuberósa

Cup 1-2 cm. wide, tan or yellow-brown, smooth, cup-shaped or funnel-shaped, then plane; stems arising from a black mass or sclerotium, 1-3 cm. wide, 2-5 cm. by 1-2 mm., brown, smooth, flexuous; spores clear, elliptic, 11-15 × 5-6$\mu$. The name refers to the black sclerotium from which the cups spring.

Usually in dense clusters on the ground in moist woods; not tested.

MACROPODIA

### Macropódia mácropus

Cup 1-3 cm. wide, disk even, grayish-brown to brown, outside somewhat lighter, scurfy with small irregular masses, cup-shaped, then more or less expanded, but the margin erect, rarely if ever drooping; stem 2-5 cm. tall, gray to grayish brown, cylindric or somewhat broader above, scurfy, even, elastic, solid;

FIGURE 119.
MACROPODIA MACROPUS

spores clear, elliptic, then fusiform, warted when mature, with one or two large oil-drops, 18-30 × 8-10μ. The name refers to the large stem.

On the ground in shady woods, June to September; probably edible.

### PEZIZA

### Key to the Species

| | | |
|---|---|---|
| 1. | Cup bright orange | *P. aurantia* |
| 2. | Cup yellowish to brown | |
| a. | On wood | *P. repanda* |
| b. | On the ground | |
| (1) | Light brown, outside coarsely granular | *P. vesiculosa* |
| (2) | Deep brown, outside finely granular or smooth | *P. badia* |

FIGURE 120. PEZIZA REPANDA

### Pezíza aurántia Orange Cup

Cup 1-5 cm. wide, bright orange, the outside powdery, pinkish or whitish, cup-shaped, then saucer-shaped and irregular, stemless or nearly so; spores clear, elliptic, strongly netted, 15-18 × 8-9μ. The name refers to the color.

Common in the woods and along roadsides in the fall; edible.

### Pezíza repánda Disk Cup

Cup 5-10 cm. wide, disk pale brown, darker when old, paler and powdery outside, cup-shaped, then saucer-shaped and finally plane, margin more or less split and wavy, with a short grooved stem-like base; spores clear, elliptic, 14-18 × 8-9μ. The name refers to the flattened cup.

On wood, common; not tested.

### Pezíza vesiculósa Bubble Cup

Cup 2-7 cm. wide, disk light brown or yellow-brown, more or less wrinkled, outside yellowish or brownish, with coarse granules, forming scales or bubbles, margin incurved, cup-shaped, more or less irregular, stemless; spores clear, elliptic, 18-20 × 12$\mu$. The name refers to the bubbled cup.

Clustered, on the ground in woodland or grassland; edible.

### Pezíza bádia Bay Cup

Cup 1-4 cm. wide, disk dark brown, outside paler brown, powdery, margin slightly toothed or entire, incurved, cup-shaped or somewhat flattened and irregular; stemless or with a small stem-like base; spores clear, elliptic, 14-18 × 8-9$\mu$. The name refers to the color of the disk.

On the ground in woodland and grassland; edible.

LACHNEA

### Key to the Species

| | | |
|---|---|---|
| 1. | Cup red, with brown bristles at the margin; on wood | *L. scutellata* |
| 2. | Cup gray, the outside hairy; on the ground | *L. hemisphaerica* |

### Láchnea scutelláta Red Disk

Cup 2-10 mm. wide, scarlet to vermilion-red, margin with long brown bristles forming a fringe, saucer-like or flat, stemless; spores clear, elliptic, more or less netted, 16-24 × 10-14$\mu$. The name refers to the disk-like form.

Common on wet sticks and logs in damp or wet places, especially at the water's edge; too small to be important.

### Láchnea hemisphaérica Gray Cup

Cup 1-4 cm. wide, disk bluish-white to gray, outside brownish with bristles which are somewhat more prominent at the margin, cup-shaped or saucer-like; spores clear, elliptic, rough, 18-25 × 10-14$\mu$. The name refers to the form.

Common on moist ground or on much-decayed wood; not tested.

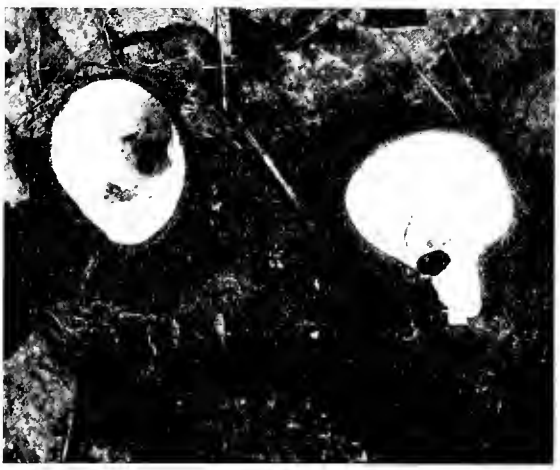

FIGURE 121. LACHNEA HEMISPHAERICA

FIGURE 122. CORDYCEPS MILITARIS

## BLACK FUNGI PYRENOMYCETES

Three families of this order are represented by forms sufficiently large and common that the beginner should know them, although none of them are edible, with one exception. The spores are borne in sacks, which are found in flask-shaped cellars or cavities. When these are single, the fungus is too small to be seen by the beginner, but when these cavities are grouped in masses, the plant may attain a considerable size, as in the following. The forms that grow on wood are usually black, but a few which have become parasites on other fungi and on insect larvae are bright-colored.

### KEY TO THE GENERA

| | | Page |
|---|---|---|
| 1. On living plants or insect larvae | | |
| a. Parasitic on Lactarius | **Hypomyces** | 150 |
| b. Parasitic on insect larvae | **Cordyceps** | 150 |
| 2. On trunks, and decaying wood, rarely on the ground | | |
| a. Plant club-shaped or cylindric | **Xylaria** | 151 |
| b. Plant more or less hemispheric | **Daldinia** | 151 |

### HYPOMYCES

### Hypómyces lactifluórum

Cellars or perithecia imbedded thickly in the orange surface of species of Lactarius which are so changed by the parasite that they fail to develop gills or other features; the reddish mouth of each cellar alone is visible; spores spindle-shaped, clear, rough, 12-celled, pointed at the ends, 30-38 × 6-8$\mu$. The name refers to the host.

Parasitic on species of Lactarius, the two fungi making an excellent combination for the mushroom epicure.

### CORDYCEPS

### Córdyceps militáris

Cellars or perithecia embedded in an orange club-shaped stalked mass which arises from the body of caterpillars, often more or less buried in the soil; club

2-4 cm. by 5-7 mm.; stem 3-5 cm. by 3-5 mm.; spores very long and thread-like, finally breaking to pieces. The cellars show as small warts. Not edible.

FIGURE 123. XYLARIA POLYMORPHA

XYLARIA

### Xylária polymórpha

Plant club-shaped, stalked, club 5-8 cm. by 2-3 cm., black without, white within, dotted by the cellars or perithecia; stem 2-5 cm. by 5-10 mm., black, rooting; spores brown to dark, ovoid, 20-32 × 5-9$\mu$. The name refers to the many forms.

Common on stumps or the ground about them; not tested.

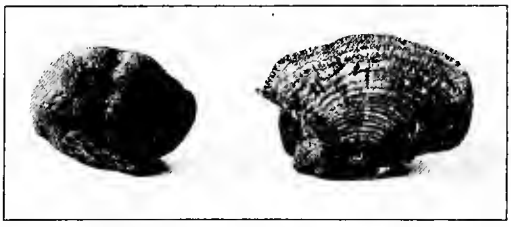

FIGURE 124. DALDINIA CONCENTRICA

DALDINIA

### Daldínia concéntrica

Plants head-like or hemispheric, 2-5 cm. wide, black, coal-like, with concentric layers on the inside, each layer consisting of perithecia; spores brownish, ellipsoid, 12-15 × 7-10$\mu$. The name refers to the layers.

Common on dead branches, trunks, etc.; not edible.

# Use of Mushrooms

## EDIBLE AND POISONOUS MUSHROOMS

In the preceding pages, 315 mushrooms are described. Of this number, only three are deadly poisonous; a half dozen are violently emetic in their effect upon some people, though harmless to others, and about the same number have such persistently unpleasant odor or taste that they will be universally rejected, though none of them are actually poisonous. Of the remainder, 230 species are edible; 50 are too tough or too small to be of real value, and 15 are still to be tested thoroughly, though it is probable that they are all edible. The deadly poisonous mushrooms are all species of Amanita: A. phalloides, A. verna and A. muscaria (figures 1, 2, 4). Each species contains a somewhat different poison, though they all act as powerful and fatal depressants upon the heart action. The chief antidotes are atropine and injections of salt solution. The effects of Amanita poisoning usually do not appear for 9-12 hours, and at this time remedial measures are too often unavailing. In consequence, every one who collects mushrooms for food should spare no pains to avoid getting Amanita into his basket. This means that he must learn to recognize Amanita under all conditions, and that as a further safeguard, he must learn the edible genera and species just as he would learn so many flowers or fruits. **Mushrooms with white gills, a ring about the stem and a volva at the base of the stem must always be avoided.** When it shows these three features, an Amanita can readily be distinguished from all other mushrooms. The greatest danger occurs in the button stage, or in old age when the volva or ring has more or less completely disappeared. Button Amanitas have been mistaken for puffballs, with fatal results, but this will never occur, if it is borne in mind that even the button as usually found will show gills when cut open, a feature entirely lacking in the puffball. Perhaps the safest plan is to avoid all mushroom buttons, unless there is clear-cut evidence from their growth or the more mature plants alongside of them that they are not Amanitas. In other words, mushroom buttons should even less be taken on faith than the adult forms. As to the old forms, the best method is to become so familiar with the marks of Amanita, as shown in figures 1-3 that they will be recognized under all conditions. While the deadly poisonous mushrooms are few in species and in individuals, no chances whatever should be taken with them. The opinion of one who does not know them definitely by their scientific names is worse than worthless; it is dangerous. The same statement applies to the various rules-of-thumb for detecting poisonous forms. These would all be laughable, if they did not often lead to fatal results. The change of color of the flesh, the floating or sinking in water, the discoloration of a silver spoon and other supposed tests are mere superstitions, unworthy of the slightest credence. Even the best cookbooks are often dangerously misleading.

A few species, such as Lepiota morgani and Clitocybe illudens, produce violent vomiting in some cases. The beginner must be on his guard for such forms, until he has carefully tried a small piece on himself to discover whether it is harmful or harmless. These contain no deadly poisonous substances, as does Amanita, so that while they are promptly rejected by some stomachs, they are innocuous or even delicious to others. Both of these species indicated above, together with a few others, such as Boletus luridus and Gyromitra esculenta are readily distinguished, and the collector should early familiarize himself with their earmarks. It is a safe rule, however, for the beginner not to make a hearty meal of any mushroom, until he has tried it in a small quantity, on account of the individual differences of people. The majority of fleshy mushrooms, especially such genera as Coprinus, Agaricus, Lycoperdon, Pleurotus, Collybia, and Morchella, are acceptable to all.

The amount of digestible nutriment in a mushroom is not great, on account of the large proportion of water. This is even truer of a large number of our most popular vegetables. In both cases, it is not the absolute amount of available nutriment that counts, but the part which the food plays in the dietary. In the case of mushrooms, their delicacy and flavor, the many ways in which they can be cooked, the readiness with which they combine with other foods, and especially their ability to replace the meats in large measure give them a very high value. They bring to the table what is in quality a luxury, but in cost one of the cheapest of all foods. It is much to be hoped that a knowledge of mushrooms will become widespread, bringing with it an increase in physiological efficiency and a decrease in the "cost of living."

## COLLECTING MUSHROOMS

The first requisite in collecting is to avoid all Amanitas. The second is to select only those individuals which are free from larvae or from decay of any sort. As a rule, old, discolored or dry plants should be avoided, especially in the case of puffballs, but with those species which can be preserved by drying, a dried plant is almost as good as a fresh one in many cases. The collecting basket should be provided with fresh papers, or, better, with paper bags. By this means, the plants are kept fresher and cleaner, and, even more important, the individuals of each species can be kept together. This is a matter of considerable importance in cooking, since different species require different treatment, or varying time. In many cases, it is desirable to cut the stem close to the cap; in some species, however, the stem is equally good, and in others, it only requires longer cooking. The question of stems is largely a personal one to be decided by the taste and experience of each person. The essential thing is to cut the stem in such fashion that adhering dirt or other material is left behind. After collecting, mushrooms if fresh can be kept for several days on ice, but it is much better to use them at once.

In preparing mushrooms for cooking, they should be picked over, the stems separated if need be, and thoroughly washed, usually in water that has been salted. The further treatment varies more or less for the different kinds, and of course with

the method of cooking to be employed. A few of the best recipes for cooking mushrooms in the various ways have been selected, and a short summary is also given of the best ways for cooking the various forms.

## RECIPES

### SOUP.

1 quart mushrooms (any edible sort)
3 pints water
½ pint milk
1 tablespoon flour
2 level tablespoons butter
1 dessertspoon salt
1 teaspoon pepper

Carefully clean mushrooms. Put in a well-covered boiler with the water, and boil slowly for one hour. Rub the whole through a colander. Reject that which does not rub through readily. Add milk thickened with flour, butter, salt and pepper. Bring to a boil. Serve. This makes two quarts of soup. McIlvaine.

### STEWED MUSHROOMS ON TOAST.

Cut the mushrooms—caps and stems—into pieces of equal size. Place in a covered saucepan. To each pint add two level tablespoons of butter. Enough water will have been retained by the gills after washing to make sufficient liquor. Stew slowly twenty minutes; season to taste with pepper and salt. Place upon toast.

### TO STEW THE TOUGHER MUSHROOMS.
(Hydnaceae, Polyporaceae, etc.)

Cut into small pieces of even size. Soak for half an hour in tepid water. Remove from water, but do not drain; place in covered pan and simmer for forty minutes. Add proper proportion of thickened milk or cream, butter, pepper, salt.

Those who like may add parsley or nutmeg, or beef gravy; in fact, any flavoring.

McIlvaine.

### FRIED MUSHROOMS.

1 pint mushroom caps
1 teaspoon salt
Little milk or cream thickened with flour.
½ teaspoon black pepper
2 tablespoons butter

Place caps well drained and carefully seasoned in pan with the butter. Fry slowly for ten minutes. Add cream or milk thickened with flour and serve on hot toast. McIlvaine.

### TO FRY MUSHROOMS.

Lay them in a frying pan in which butter has been heated boiling hot. After frying five minutes serve on a hot dish—pouring over them the sauce made by thickening the butter with a little flour. This is as delicious as more elaborate ways of cooking and retains the mushroom's distinctive flavor in full perfection.

McIlvaine.

### TO BROIL ANY CAP FUNGUS.

Select those that are spread open and keep the unopened for the other styles of serving. Cut off the stems close to the tops. Baste well with melted butter and sprinkle lightly with pepper and salt. Heat the broiler very hot, lay the caps upon it with the gills up and broil over a clear fire, turning the broiler first on one side and then on the other. As soon as tender, which will be in about five minutes, open the broiler, remove the caps with care, and place on well-buttered slices of toast which have been previously prepared. Pour over the whole a sauce made of drawn butter, or hot water thickened with flour to the consistency of cream. McIlvaine.

### BAKED MUSHROOMS OF ANY GILLED KIND.

Wash, place the caps in a tightly covered dish or pan after dipping them in bread crumbs. Arrange in layers with a small piece of butter on each mushroom, as well as the proper amount of pepper and salt. Bake from twenty to forty minutes as suits the consistency of the species. Serve on toast.

Cheese grated on each layer makes a desirable addition. McIlvaine.

### BAKED MUSHROOMS.

Arrange mushrooms in a baking dish with alternate layers of sliced onions, seasoning each layer. Cover with cracker crumbs; dot with butter. Pour over all half a cup of water or milk and bake from twenty to forty minutes.

Benedict.

### CROQUETTES.

1 pint well-cooked mushrooms of meaty species. (See "Patties")
2 hard boiled eggs
1 sprig parsley
pepper
salt
2 level tablespoons butter
1 level tablespoon flour

Chop the mushrooms, parsley and eggs together very fine, with pepper and salt to taste. Mix flour with butter over the fire and when well blended add the first mixture, mixing thoroughly. Set aside to cool. When cold, shape, dip in egg and bread crumbs and fry in hot butter, oil or fat. McIlvaine.

### PATTIES.

The mushrooms good for croquettes and patties are such as the puff-balls, Lactarii, Gomphidius rhodoxanthus, Fistulina hepatica, Tricholoma personatum, and many others of the meaty kinds.

Cut the mushrooms into small pieces and cook slowly until tender, adding butter, pepper and salt. Let them cook until almost dry, then add cream or milk and thickening. Fill pastry shells and serve. McIlvaine.

### DEVILLED MUSHROOMS.

Prepare as for patties, adding the yolks of two hard boiled eggs to each pint of meat, a pinch of red pepper and a little chopped parsley. Serve hot or cold in halves of egg shells, nested among green. McIlvaine.

### SALADS.

Many species of fungi make good salads. The best of these are Russulae when young, fresh and firm, either sliced raw, or stewed and drained; Tricholoma personatum, raw or stewed; Clitopilus prunulus, raw or stewed; Coprinus comatus, C. micaceus and C. atramentarius, raw; Clavaria, fresh, young, brittle, either raw or stewed; Fistulina hepatica, raw; any of the edible Polyporaceae or Hydnaceae, after stewing; the puff-balls, raw or stewed. Any favorite species will make a salad.

After cooking, drain and cool. Mix with mayonnaise dressing, or make a dressing to taste of oil, vinegar, salt and pepper. Serve on lettuce.

McIlvaine.

### FRESH MUSHROOM SAUCE.

2 tablespoons butter
2 cups fresh prepared mushrooms
salt and pepper

Put butter in graniteware or porcelain-lined saucepan. When hot add mushrooms, cover closely and cook briskly two or three minutes. Season to taste with salt and pepper, and serve with broiled beefsteak, birds or sweetbreads.

Mrs. E. B. Ewing.

### TO DRY MUSHROOMS.

Take those neither very young nor very old. Remove the butts only. Then slice, string or skewer the slices lightly, and expose to a current of warm dry air. A warm oven with the door open is a good place. When quite dry and shrivelled, pack in tins with spice at top and bottom. When wanted for use, soak the slices in tepid water for some hours. Then cook. Hay.

### TO CAN MUSHROOMS.

Peel, dry, wash thoroughly and boil in well-salted water until done. The shaggy manes, inky caps, honey caps and morels, and nearly all others, require but little cooking and a very little water. Amillaria, Collybia, Coprinus and Morchella seem to keep much better than Agaricus and Hypholoma. The morels and puff-balls are much better chopped fine with as little water as possible. Be sure to salt abundantly and have boiling hot to seal. Benedict.

### MUSHROOM PICKLES.

One-half peck of either Agaricus campester, Lepiota procera, Hypholoma fasciculare, Hypholoma perplexum, Clitocybe multiceps, or Russula virescens. Select

sound specimens, cut off ends of stems (entire stems of Hypholoma fascicularis or Lepiota procera) and rub the tops with flannel dipped in salt. Throw them into milk and water (one-fourth milk). Drain and put them into a stew pan. Sprinkle the layers with salt—one-half gill to one-half peck mushrooms. Cover them close and put over a gentle fire for five minutes to draw out the water. Then put them on a coarse cloth and drain until cold (or put on mosquito netting in a colander).

To prepare a pickle for them: Take one-half gallon vinegar (if strong, dilute with water), two ounces mace, one-fourth ounce cloves, one-half pound salt (Worcester), one teaspoonful red pepper, one nutmeg cut in slices.

Put in a jar covered with a wet cloth and keep the cloth wet. Place over a very slow fire, cook as long as the acid is prominent *and no longer.*

Take small wide-mouthed bottles, fill with the mushrooms, and pour on the pickle until the bottle is filled. Tie down tight. (To slice a nutmeg, boil it in vinegar, —slice while hot. Makes of salt vary in strength: the Worcester is a strong salt.) N. B. When H. fascicularis is used, wipe the tops with a wet cloth.

McIlvaine.

### MUSHROOM CATSUP.

Remove the butts. Sprinkle all with salt. Pile in a bowl. Let them remain so for three days, stirring occasionally. Then squeeze out all the liquor. To each gallon, add half an ounce each of cloves and mustard seed, crushed; one ounce each of allspice, peppercorns and ginger. Heat slowly up to the boiling point in a covered vessel. Set aside in a warm place for a fortnight. Then strain and bottle. If the catsup shows signs of not keeping, add more salt and spice, heat and proceed as before. Hay.

### SPECIAL RECIPES.

**Boletus:** Remove stems and tubes unless they are compact and young, or the dish will be slimy from the tubes. Wipe the caps clean. Broil; stew in little water; bake in covered dish; or fry.

**Cantharellus cibarius:** Cut mushrooms across and remove the stems. Fry after dipping in egg and bread crumbs; stew slowly forty minutes, in covered saucepan; or roast.

**Clavaria:** Fry; stew, covered with a little water for half an hour over a slow fire.

**Clitocybe multiceps:** Remove stems. Bake with cheese for half an hour, or fry.

**Coprinus:** Bake in slow heat in oven for twenty-five minutes, in a covered dish. Stew slowly in covered dish for five to ten minutes.

**Fistulina hepatica:** This always has a slightly acid taste which is very acceptable to most persons, but objectionable to a few. Slice as one would egg-plant and fry. Cut across the grain and stew slowly in covered pan for twenty minutes. Use in salad raw.

**Hydnum:** Use tender parts only of stems and caps of cap species, and soft fresh parts of the maned species. Care must be taken to cook slowly and well. Stew from thirty to forty minutes; croquettes or patties.

**Hypholoma:** These have a slightly bitter taste, of which most persons are fond; if it is objectionable, add a small amount of lemon juice or sherry. Stew; bake thirty minutes.

**Lactarius:** The rich juices of these are best retained by baking. The species grow hard and granular if cooked too rapidly. They are good also stewed.

**Marasmius oreades:** Remove stems; stew; fry; dry.

**Morchella:** Stew.

**Pleurotus:** Remove tough stem part, if any, and use only such parts as seem fresh and tender. Cut across the grain into small pieces and stew. Fry as oysters are fried, after cutting into pieces the size of a medium oyster. Stew fifteen minutes and bake with cheese, pouring liquor from stew over the dish.

**Puff-balls:** Fry as egg-plant after removing thin outer rind; stew; patties; salad. Should be perfectly white inside; any stains or yellow part should be removed, otherwise they will be bitter.

**Tricholoma personatum:** Stew thirty minutes.

# Glossary

**acrid,** sharp, biting
**adnate,** with the full width of the gill touching the stem
**adnexed,** touching the stem with less than the full width
**angular,** with an irregular outline, with angles
**appressed,** flattened to the surface
**astringent,** bitter, "puckering"
**basidium,** the swollen tip of a thread, usually bearing four spores
**bulbous,** swollen, more or less bulb-like
**cartilaginous,** like cartilage, horny
**cystidium,** a larger spine-like or club-shaped body among the basidia
**decurrent,** sloping down the stem
**depressed,** bent down
**discrete,** separating readily
**excentric,** out of the center of the cap
**farinaceous,** resembling meal or flour
**fibrillose,** with little threads
**floccose,** cottony, tufted
**fusoid,** shaped like a spindle
**gelatinous,** jelly-like
**globoid,** more or less like a globe, i. e., spherical
**globose,** shaped like a globe, spherical
**guttate,** containing a drop or bubble
**heterogeneous,** unlike in texture
**homogeneous,** like in texture
**hymenium,** spore-bearing surface, gills, pores, teeth, etc.
**imbricated,** arranged like tiles or shingles
**inflated,** swollen
**labyrinthine,** winding, like a labyrinth
**linear,** line-like
**membranous,** thin, papery
**mycelium,** the mass of white threads, usually hidden, from which the mushroom grows
**mycophagist,** one who eats mushrooms
**ocher,** dull yellow, yellow tinged with brown
**ovate,** egg-shaped
**ovoid,** more or less egg-shaped

**perennial,** growing for several years
**pungent,** sharp, biting
**sclerotium,** a hard black mass of fungus threads
**sinuate,** with the gill notched where it joins the stem
**striate,** marked with streaks or lines
**subglobose,** more or less globe-like
**superior,** above the middle
**trama,** the middle layer of a gill
**umbilicate,** sunken, like a navel
**umbo,** a raised disk or boss
**umbonate,** with a disk or boss
**veil,** a membrane covering the gills or the cap
**viscid,** sticky, covered with glue
**volva,** a cup or sheath at the base of the stem

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